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GENERAL CONFERENCE OF ARCHITECTS, 1878.

THE Fifth* General Conference of Architects, held under the auspices of the Royal Institute of British Architects, commence its proceedings on Monday evening last, in the rooms at Conduit-street, which were inconveniently crowded. Mr. Charles Barry, president of the Institute, occupied the chair, and read the following address:—

Gentlemen,—I do not think it would be in good taste, when we have the promise of a paper from one among our distinguished band of Honorary Associates, Mr. Armitage, to detain you long with words of mine; but it seems to be considered my duty in some formal way to open the Conference with an address. I cannot, I think, do so better than by bidding a hearty welcome, in the name of the London resident members, to those of their brethren who have taken the trouble,—at no small sacrifice, as I am well aware, of time and money,—to come among us on this occasion.

It has been well said somewhere that if this Institute is an earnest body, if it indeed represents among its members British architects, these Conferences will become a necessity of its existence, as well, I hope, as means for affording pleasure to all,—and information to all. Since the last Conference in 1876, the Institute has passed through more than one organic change. I fully trust and believe, as I hope you all do, that those changes have added to its vitality and vigour, and have in some measure better enabled it to assert and maintain the best interests of the profession,—interests which I can never believe are diverse from, or opposed to, the interests of the public.

It is impossible, I think, to believe that these meetings cannot do much good amongst us, or that men to whom professional life and labour is a very earnest matter indeed, can meet each other, as they have here an opportunity of doing, without gaining knowledge of much importance to them in their work. And what is, in my opinion, of much more value, they can hardly be brought together in friendly personal conference for a week without a lasting impression being made on their minds how much better it is for themselves, for their art, and for their clients, to be united rather than divided. And surely it is well for our members (now a rapidly increasing number),—and it would be well for those architects of position who still, to my surprise, remain outside our society,—to be able all to feel that there is in England at least one organised body to represent them in the world, to which they can appeal when in difficulty, and which, because it numbers among its members all who are really entitled to be termed architects, can speak with authority, to correct public errors of judgment, and to take a stand, if need be, in asserting the rights, interests, and honour of our profession.

As on former occasions, an anxious committee has worked hard to promote the success of this Conference in obtaining communications of much interest, which will be brought before the meetings in this room, and which I cannot doubt will produce discussion of interest to all.

In the selection of the papers to be read here before you, I think that the committee have exercised a sound judgment in including subjects of practical working interest to architects; and while the paper now to be read deals with the artistic functions of an architect, the concluding papers on Friday next will appeal to him as antiquary and archæologist.

Arrangements have also been made, as will be seen by reference to the Conference programme, to occupy a portion of each day with visits to noble collections of pictorial art, and to modern agricultural works in progress, which are of the greatest interest; and which latter we may, perhaps, dare to hope may not be deemed without merit by succeeding generations.

Let me, then, express a hope, present I am sure to the minds of all here, that this meeting may add its impulse to the promotion of that feeling of brotherhood,—integrity and honour, without which no real progress can be made,—and no personal happiness can long endure.

* The first Conference was held in 1871, the second in 1873, the third in 1874, and the fourth in 1876. Copious notes of the proceedings will be found in the volumes of the *Builder* for the respective years.

MURAL PAINTING.

MR. EDWARD ARMITAGE, R.A., Hon. Associate, then read the following paper:—

It appears to me that the election of a considerable number of painters into your body should not be looked upon merely as a graceful compliment paid to a sister art, but also as a means of promoting a better understanding between the members of the two professions. By the words "better understanding," I mean more frequent and more cordial co-operation. It is with a view towards this end that I have written a short paper on the possible revival of the art of mural painting in England. The word "revival" is hardly suitable, as this branch of the art has never flourished in England. It ought rather to be replaced by the word "birth."

Having carefully considered this subject from all points of view, I have come to the conclusion that there are three principal causes which impede the growth of this the noblest branch of our profession:—

First. The enormous cost of modern high-class work.

Secondly. The want of harmony between the work of the architect and that of the painter.

Thirdly. The perishable or unsatisfactory nature of the materials generally used.

I propose to examine these three causes *seriatim*, and to offer suggestions for their removal. First, as to cost. I need hardly apologise, in addressing practical men, for introducing this very important element into the question to be discussed. Æsthetic laymen may rave (as they did at the Antwerp Congress of last year) about art being a "religion," a "subtle essence," a "priceless gem," which it is a profanation to associate with any miserable question of money. All this may be very poetical, but it is not practical, and can lead to nothing. Let us, therefore, take the bull by the horns and frankly examine the question of cost. Mural painting of a very high class need not be enormously expensive, if artists would only bear in mind what is the kind of work required. They too often forget that the qualities of high finish, *chiaro-oscuro*, richness and depth of colouring, so highly prized in an easel picture, are not only unnecessary, but actually detrimental to mural painting. They often labour at details or subtleties of modelling which take up a great deal of time, but are really of no value for decorative purposes. Time is money, and hence a work which takes an artist two years to complete will be very expensive, but if he could make up his mind to finish it in six months, it might be done (and would probably be better done) for one-fourth of the money. The question of cost is also closely connected with the nature of the subjects to be painted. Most of the frescos and wasserglas paintings in the Palace of Westminster are not properly decorative works, but rather a series of gallery pictures executed with water, instead of oil, and an elaborate treatment was almost imposed on the artists by the nature of the subjects. Whenever passages from English history and kindred subjects are required to be illustrated, the work must always partake more or less of easel painting, especially where the panels are close to the eye. On the other hand, ceilings, spandrels of arches, friezes, &c., can be treated in a strictly decorative style. Good composition, firm correct outlines, filled in with flat tints of harmonious colour, is really all that is necessary, and it is possible that this kind of painting might be done rapidly and at small cost. It is obviously impossible to fix a tariff for artistic mural painting, but some step in this direction may be made by an examination of the sums paid abroad to distinguished artists for their work. If we divide the price paid to Paul Delaroche for the Hemicycle by the number of square yards the work contains, we find the cost to have been about 30*l.* per square yard, and if we make the same calculation in respect to Flandrin's frieze of St. Vincent de Paul, we find that the work was done for less than 22*l.* a square yard. Delaroche's work can hardly be called decorative. It is an elaborately finished oil-painting, but Flandrin's may be taken as a fair specimen of decorative painting of the very highest class. Where the panel to be painted is small, and where the figures are required to be less than life-size, the artist would naturally require a higher rate of remuneration, but after taking this into consideration, and after making every allowance for our extravagant age, I think that no mural painting ought to cost more than 50*l.* a square yard, and that a great deal of effective and good work might be done for less than half that price,—certainly where the work is at great distance from the eye. I am speaking of fairly remunerative prices. Of course, it

] as happened, and will often happen again, that an artist may undertake an important work for the sake of increasing his reputation, or he may be influenced by other motives which may induce him to accept a mere nominal sum; but it is clear that these cases must always be exceptional, and cannot properly enter into our calculation of cost.

I have entered into these ignoble details because I wish to correct the general impression that mural painting of a high class must be always very expensive. It may be so *now*, but that is because so little of it is done in this country. There is no demand, and therefore no supply; but if architects and their employers would open out a fair prospect for the practice of mural figure-painting, I have no doubt but that painters would be found who would (like certain artists of the Continent) devote themselves to this branch of the profession. It is not sufficient that the artist should be well qualified for the work. He ought to have at his command a staff of trustworthy pupils or assistants. These are not improvised at a moment's notice, and without their co-operation mural painting as a rule would be profitless work. No artist can expect to make as large an income by decorating buildings as he would by painting popular pictures. What Dr. Johnson called "the potentiality of becoming rich beyond the dreams of avarice" is out of his power. If the speedy acquisition of a large fortune be denied the mural painter, on the other hand he is saved from many of the minor annoyances to which the painter of easel pictures is exposed. His work is not relegated to the gallery or dining-room of some so-called patron of the art, to re-appear at intervals at Christie's sale-rooms, or very possibly left on his hands without finding a purchaser at all. He is independent of the dealers and the commercial element in art. He is beyond the range of the annual attacks of fine-art critics, whose small stings are really a cause of great annoyance to thin-skinned painters. He has not to flatter or please his sitters, nor to paint "pot-boilers" for the market. Finally, he is educating public taste, and, therefore, benefiting his country in a more direct manner than the successful portrait, *genre*, or landscape painter.

If we now turn to the second cause I have specified, viz., the want of *entente cordiale* between the architect and the painter, I am afraid we shall here find faults on both sides. The architect is often too apt to think of nothing but his own share of the work. He neglects to leave convenient and well-lighted wall-spaces for the painter. No artist of any standing will care about having his work relegated to a dark corner, or overpowered by stained glass and a profusion of late Gothic details. Again, the architect sometimes expects the painter to adopt the quaint composition and uncouth drawing of the thirteenth or fourteenth centuries as being more in keeping with the style of the building. If the painter happens to belong to a certain school, this obligation may be congenial to him, but generally speaking it is not, and hence a fertile source of disagreement between the architect and painter. On the other hand, the painter often forgets that his work is ancillary to the architect's. In an easel picture he chooses his frame to suit the painting, but here he must reverse the process and suit the painting to the frame, the frame being the surrounding building. He must regulate the size of his figures, his light and shade, his perspective, all the elements, in short, of his work, solely with reference to the site it is to occupy. To neglect this is antagonistic to all good work. The architect and the painter should be in complete harmony, like the violin and alto in an orchestra. Where they vie with each other as to who shall attract the most attention the result is fatal.

I will now consider the third impediment to the practice of mural painting, viz., the perishable and unsatisfactory nature of the materials generally used. Real fresco painting has been a complete failure in England as far as durability is concerned. Of this there can be no doubt, but opinions differ as to the cause of this failure. Impure colours, the omnipresent gas, the humidity of the climate, have all been assigned as reasons for the premature decay of our frescoes, but from my own experience I should say that the real cause lay in the bad quality of the lime and sand used in the composition of the mortar. Immense pains were taken at Westminster Palace to get the oldest possible slaked lime procurable, and hogsheads of this curious old lime were imported from Munich. It was kept in tanks in the crypt of the Palace, was watered and skimmed from year's end to year's end, until at last it almost ceased to have any of the adhesive, cohesive, and caustic properties which are indispensable to making good mortar. The sand, again, was a great deal too soft to the touch, and the consequence was that the mortar or *intonaco* was not sufficiently binding, and could neither fix the colours properly nor even consolidate itself. This mania for old worn-out lime has been the bane of fresco-painting in England, and it is probable that no more experiments will be made in this direction. Ordinary oil-painting is notoriously unsuitable for mural work, but if an absorbent ground be used (that is, a ground prepared with size instead of oil) many of the objections to oil-painting are removed at once. I am engaged at present on the cartoons for some panels to be let in to a reredos in a modern church. These panels are of slate (about 5 ft. by 3 ft.), and their surface is being prepared by my colourman in exactly the same way that an absorbent canvas is primed. I shall use oil colours with a little wax dissolved in the medium, and as the light is good, I fully expect thus to obviate all the inconveniences connected with ordinary oil-painting.

There remain wax-painting (*peinture à la cire*) and silica or wasserglas. Until quite recently, I did not think much of either of these methods. The wax-paintings in the Paris churches, however great their artistic merit may be, do not harmonise with the surrounding building as real fresco would. They look like rather dull oil pictures, and have not the charming decorative properties of fresco or mosaic. The same may be said of Kaulbach's wasserglas paintings at Berlin.

About six weeks ago I went to Ypres and Courtrai, in Belgium, to see the modern mural paintings which have been executed there, and I came back quite a convert to both methods employed. The wax-paintings of Pauwels, at Ypres, are immediately opposite, and on the same level with a strong glaring light, but they are as perfectly *seen* as if they were water-colour or fresco. They are totally different in appearance from any wax-painting I ever saw. The same good qualities are very striking in Swertz's wasserglas paintings at Courtrai. His work at Ypres, and that of the Belgian artist Guffens, may be equally satisfactory; but the light is a side light, and does not, therefore, test the fitness of the material for mural work in so severe a manner.

At Courtrai I cross-examined the man who assisted the artist in the mechanical operation of applying the silica. It would be out of place here for me to enter into professional details, particularly as my only authority in the matter was the assistant; but I may say that the artist has a method of his own, the result of which seems to be most admirable.

I do not think there can be a doubt of the durability either of Pauwels's wax-painting or of Swertz's silica method. Some of the work has been done six years, and there is not the faintest trace of bloom or decay of any kind. Besides, the wax method has been known and practised for more than forty years in Paris, and the wasserglas for more than twenty-five in Germany. These modern Belgian works, of which I have been speaking, have not been executed with a new material, and there is nothing whatever in the improvements introduced by the artists which would affect their durability. The processes are no secret; and it appears to me that the problem of replacing fresco by some more permanent but equally suitable method has been solved.

To recapitulate briefly what I have said, I consider that to implant and cultivate in England a taste for mural painting, it would be necessary,—

1st. For the painters to be satisfied with moderate remuneration.

2nd. For the architect and painter to consider themselves as joint artificers in the same piece of work.

3rd. For either of the new methods recently adopted in Belgium to be employed.

The subject is one in which I have always taken a great interest, and I think that the time is rapidly approaching when it will interest others besides myself. The strong Puritanical prejudice against figure-painting in churches is being greatly mollified, and there are symptoms that corporate bodies are beginning to wish for something better than bad portraits of royal dukes in their halls. On the other hand, we have, both at the Academy and South Kensington, a sounder and more thorough system of teaching than formerly; and it would not be impossible to find, amongst the more advanced students, that gratuitous, or nearly gratuitous assistance, without which mural painting on a large scale is almost impracticable. These students would be glad to serve a kind of apprenticeship, and thus to prepare themselves for undertaking similar work.

For this happy state of things to come about, however, it is necessary that architects should take the initiative. They have for many years been successfully engaged on works of restoration. Colour has been introduced pretty freely, and no architect would now be satisfied with the whitewash of the Georgian period. Let them go a step farther, and call in the aid of the best and highest art which the country can produce. Instead of employing men whose position in relation to painting and sculpture is analogous to that of the commonest builder to architecture, let them patronise painters of original talent, but who at the same time are gifted with common sense; men who will neither degrade their art by imitating archaic deformity, nor shock the proprieties by the introduction of sham classicism into a Mediæval building. Mistakes in the choice of a painter would doubtless be made, just as mistakes are sometimes made, I am afraid, in the choice of an architect; but the general system would be sound, and would, I think, lead to noble results. The sharp, hard lines which sever the three professions would become softened; sculptors and painters would know a little more about architecture; and *architects* would learn something of the sister arts.

I hail with satisfaction the introduction of the thin end of the wedge by the admission of painters and sculptors as Honorary Associates of this Institute. It rests with the members of your profession to drive the wedge home.

In the discussion which followed,—

Mr. Waterhouse said he had listened to Mr. Armitage's paper with the greatest interest, because it was proposed to see what could be done in the Manchester Town-hall in the way of providing good mural paintings. He believed, however, that one of the greatest mistakes he had made was to form his panels too long in proportion to their height, and all the painters who had looked at them had said that they would be very expensive panels to fill up, as the figures could not be life-size, and consequently there would be much more for the painter to do. When the Corporation of Manchester contemplated the provision of mural paintings to adorn their Town-hall, they asked him to go and see what he could find in the way of good and successful modern works of the kind, and he went to the Low Countries and saw some of those very excellent works to which Mr. Armitage had referred, and was particularly struck with those by the artists Guffens and Swertz. He had, however, experienced great difficulty in persuading any English artists to adopt the *wasserglas* method. They seemed to feel that the method having been tried on so large a scale at the Houses of Parliament, and having failed completely or given unmitigated trouble, they would do best to avoid it. He must confess to another mistake he had made, but at the instance of an artist who had given a great deal of attention to the matter, he was induced to prepare the panels in one of the rooms with some of the old lime referred to by Mr. Armitage. He did not know that it came from Munich originally, but he was informed that it had been reserved from the Houses of Parliament. It had been mixed with powdered marble, at the instance of the artist before referred to, and he (Mr. Waterhouse) was bound to say that it had made what was, he believed, the hardest plaster he had ever touched, and it seemed to have a very firm grip of the wall. The wall behind it was only 4½ in. thick, with an air-space at the back of it, through which passed the warm air which was to heat the room, so that there would never be cause to fear damp. The artists who were at present at work were Messrs. Madox Brown and Shields, who, between them, were going to paint twelve panels illustrative of the history of Manchester from the earliest times,—from the introduction of Christianity down to Peterloo. The cost of these paintings would be about 30*l.* a square yard, and it would not have been so much but for the circumstance already mentioned.

Mr. Armitage said he ought to have added that the surface on which the Belgian works he had referred to were painted, was the

same as would be used for fresco. The wall was of brick, prepared, in the first instance, with a coat of rough mortar, and then rendered with a fine coat, only, in using the wasserglas method, the mortar was allowed to get thoroughly dry before the colours were applied. They were applied directly on to the surface of the fine coat before mentioned.

Mr. C. J. Phipps said that as to the question of cost, he was at liberty to state that he had paid Mr. Holiday and Mr. Marks each 200*l.* for a frieze 30 ft. long by 6 ft. high, which would come to about 10*l.* per square yard; to Mr. Albert Moore, for the same sized frieze, he had paid 15*l.* a square yard. In each case the figures did not exceed twelve in number.

Mr. Joseph Clarke said that in the chancel of the Church of St. Alban, at Rochdale, erected by him many years ago, there was a painting in fresco by Mr. Albert Moore. It was painted twelve years ago,—some years after the church was built, and the surface was vitrified. This painting was as perfect now as on the day it was completed. It was painted in tempera, on no specially-prepared ground, Parian cement being, if he remembered aright, the surface painted upon. The wall was not hollow, and was built of coarse rubble work. The cost of the painting was 700*l.*,—a very moderate sum, though somewhat in excess per square yard of the figure named by Mr. Armitage.

Mr. Street said he thought Mr. Armitage had rather indicted the architects of the present day, but there was something to be said in defence of architects as against painters. Mr. Armitage had said that the frescoes of the Houses of Parliament were unsatisfactory in treatment and unsatisfactory in their final effect. Now in that building the spaces left for the paintings were very good spaces, and it was the fault of the painters that they had not made the best use of them. The fact was that in that instance they all adopted a mode of decoration which showed that they had not studied architectural decoration at all; they simply transferred to the walls of the building just that kind of work they were in the habit of doing on canvas. The experience of any architect who had tried to employ the more distinguished amongst our painters would be, he thought, the same,—at any rate, such was his own experience. In the first place, the painter generally despised the architect's knowledge of painting, and did just exactly what pleased him best, without deigning to show the architect what he was going to do, and the consequence was that mural paintings frequently did not harmonise with the architecture; nor, as a rule, did the painters, by any systematic study of the architecture of the building, or by the study of those early examples of Italian art in which wall painting was brought to perfection, seek to make their works part of one whole. The consequence was that the architect who tried to introduce mural painting into his building began at times almost to despair. Besides the impediments and difficulties which Mr. Armitage had mentioned as standing in the way of the more general use of mural painting, there was the difficulty that while a great deal of mural painting might be done in churches in comparatively out-of-the-way places, the artists were often unwilling to execute such commissions, from a disinclination to leave the charms of studio life and London society for the purpose of spending a month or two in some comparatively dull town or village. The consequence of this was that where mural painting was a *sine quâ non*, the architect often had to go to very inferior men,—though not perhaps quite so inferior as Mr. Armitage had assumed,—to execute it. He (Mr. Street) ventured to traverse what Mr. Armitage had said or implied as to the injurious effect of the conjunction of stained glass and mural decoration. In Italy mural paintings by Orcagna, Taddeo Gaddi, and other masters, were found in juxtaposition and combination with the most brilliant stained glass; and the reason why the stained glass did not do the paintings any harm was that in the latter the artists used simple colours. One point which it might be well worth the while of Mr. Armitage and his brother-painters to consider was as to how far it might be possible to adopt such a style of art for mural decoration,—and such a process of execution,—as would allow of the faithful reproduction of the artists' designs by other hands in out-of-the-way places. Drawings, for instance, chiefly depending on outline, might be repeated in a way that more elaborate works could not possibly be reproduced in. Such a mode of procedure existed in the Middle Ages. In Norwich, for instance, there was known to have been a school of painters whose designs were transmitted to and reproduced in the various village churches of the diocese by local men. It was hardly fair to attempt a comparison between the state of mural painting in the England of to-day and the art as it existed and flourished in the Italy of the Middle Ages. In Mediæval Italy paintings were placed on the walls of every public building and every church, and this was rendered easy of accomplishment, because in Italy, during the Middle Ages, every town was a centre of art; in fact, there was any number of centres of painting in Italy at that period. On the other hand, in the England of the present age, London was the only centre of painting. As to cost, he had been amazed at the exceedingly low prices quoted by Mr. Phipps; but the works referred to were, he imagined, theatre decoration. Ten pounds a square yard for mural painting was less than half the price gladly paid for good stained glass, and if painters generally could be got to work on those terms, mural decoration would be very largely employed. Before, however, architects could do much in the way of encouraging and fostering the art of mural painting, there must arise a school of painters who would devote themselves to that branch of art, and it lay with the painters to prove that they understood how walls ought to be painted, rather than to assume that it was the architect's business to make his style suit any kind of painting which the painter might choose to adopt. As to another remark made by Mr. Armitage, it was difficult to conceive how any quantity of Gothic tracery in one part of a building could be detrimental to the pictorial decoration of another part of it. Marlborough College was a case in point. There Mr. Spencer Stanhope had recently completed a whole series of subjects in wooden Decorated frames. One of the ways in which he (Mr. Street) found it necessary and desirable to decorate buildings was by the introduction of paintings on panels, which could be done in the artist's studio and afterwards fixed in their appointed places. Among examples of this kind of thing were Mr. Burne Jones's painting over the altar at St. Paul's, Brighton; Mr. Leighton's work at Lyndhurst Church, in the New Forest; and Mr. Watts's at the church of St. James the Less, Westminster. He was not altogether prepossessed in favour of Mr. Armitage's suggestion as to the employment of mural decoration of the highest kind on such spaces as were afforded by spandrels and friezes. For mural art of the highest kind, suitable panels or spaces should be expressly provided on the walls. A great deal had been done of late years in the way of introducing permanent decoration in the shape of mosaics, and some of Mr. Clayton's designs for these were extremely good, and the simplicity and superiority of the earlier mosaics at Ravenna led him to make the remark that it was necessary for architects to try always to prevent the painter of mural decoration from revelling too much in the modern power of drawing. The more simple his work was, and the more simple was the process, the better it would be. Mr. Clarke had referred to what appeared to be a very successful work in distemper or *tempera*. Tempera was by no means to be despised. All the more satisfactory examples of mural painting in Italy were in tempera, as were the mural decorations of Mediæval buildings in England. That tempera was not of so evanescent a nature as was often supposed was proved by some remains of colour decoration at Rievaulx Abbey, which were even now in a good state of preservation in spite of three centuries of exposure in an unroofed church. If tempera painting were afterwards "fixed" by water-glass, the method would be much less fugitive than fresco. Fresco paintings generally, not excepting those in Italy, appeared to him to be unsatisfactory in effect. Their colour was generally gloomy to the last degree, and almost all the Italian frescoes had been touched up afterwards in tempera. Even Mr. Dyce's beautiful work in All Saints' Church, Margaret-street, he believed, had been touched up in that way.

Mr. Armitage.—Yes, I touched it up myself; it was all falling to pieces, and I was called in to endeavour to preserve it.

Mr. Street, continuing, said it was hardly ever possible, owing to such "touching up," to look at a fresco without seeing that it contained at least two different kinds of work. Referring to the subject of mural painting for external purposes, Mr. Street said that the last time he was at Augsburg, three or four years ago, he had been very much struck by a painting in oil on the over-hanging cornice of one of the houses, which had a most brilliant effect, and it was worth consideration whether anything of the kind could not be attempted in this country. There was another mode of painted decoration in which the painter might, without leaving his studio, help the architect, and that was by painting figure-subjects to a large scale on tiles. The joints of the tiles were not large enough to be seen, and the decoration so obtained was absolutely permanent as to its material.

Mr. George Aitchison said he was rather inclined to differ from some of the remarks which had fallen from Mr. Street. In his (Mr. Aitchison's) opinion, the painter and his work ought to be considered paramount, the architect and his building taking subordinate positions. He said this because he considered that the painter's art dominated all the visual fine arts, and therefore the place of honour ought to be accorded it. He rather thought that this would always be so, for it had ever been true that, as Pope said,—

> "The proper study of mankind is man."

Therefore, wherever human beings were represented, there the central interest would be. We might not have artists in the present day who could vie with the first men of Greece or Italy, but men only second to them were to be found, especially in France. Whenever he had been fortunate enough to secure the services of artists of eminence for his clients, he had willingly accorded to them the place of honour. He could not agree with Mr. Street as to the alleged gloomy and heavy character of the frescoes of Italy; on the contrary, some of them were as brilliant as if only done yesterday. It was, however, very questionable whether frescoes could be made to stand against the smoke, dust, and gaseous vapours with which the air of London and the large towns of the provinces was charged. It was to be hoped, now that the members of the Institute of Architects reckoned amongst their colleagues the Honorary Associates so many distinguished painters, that renewed efforts would be made to extend the use of mural decoration in churches, public buildings, and private mansions.

Mr. Henry Holiday said that subordination of architectural forms and details to the work of the painter was very marked in the Arena Chapel at Padua, but this seemed to him to be an exceptional case, and he could hardly think that architects would be quite willing to take so secondary a position as was assumed by Mr. Aitchison, although where it was contemplated to call in the aid of the painter the architect should be sparing in the use of architectural details likely to detract from the work of the painter. As to the materials and methods to be employed in mural painting, he agreed with all that Mr. Armitage had said. In the use of wax, the effect of dulness might be avoided by roughing the ground with sand before applying the wax. Such a granulated surface would diminish the tendency of the wax to become too smooth. He agreed with Mr. Street that in Italy it was rare to meet with really pure fresco, and he also agreed with him in considering tempera to be an extremely permanent method of decoration where it had a fair chance; it was certainly the most brilliant in colour, and the most rapidly executed of all methods.

Mr. Armitage, in replying on the discussion, said that as to the question of cost, instances had been quoted of mural paintings being executed for 10*l.* or 15*l.* a square yard. Such prices were conceivable only on the hypothesis that the background was large in proportion to the space covered by the figures. As to the wasserglas pictures at Westminster which had decayed and required patching and renewal, their failure was, he believed, entirely owing to the improper way in which they were painted. The method was new to the artists, and they were "not up to it." They committed the radical error of using the silica as a medium or vehicle for colour instead of reserving it for a preservative coating. He saw Mr. Herbert so misapplying the silica, and he believed Mr. Maclise worked in the same way. The Berlin wasserglas paintings, executed twenty-five years ago, were still in tolerably good condition. He was glad to hear such a good account of tempera: he was afraid that it would have been more liable to be affected by damp than it seemed to have been in the cases

mentioned. Of course, if its endurance could be ensured, nothing could be said against it, and its brightness and facility of execution were greatly in its favour. Mr. Street had somewhat misconceived his (Mr. Armitage's) observations as to the relations of the architect and the painter, for he took care to say that mural decoration should be ancillary to the work of the architect. In his opinion, the architect's was the principal work, and the painter ought to suit his work to the building. There should be no difficulty in that being done, for the architects of Gothic or Classic buildings would, if they were wise, employ artists whose predilections as to style were in harmony with their own. A principal point which architects and painters ought ever to bear in mind, when engaged on the same work, was that the work when finished was not to be *two* works, one of the architect, and one of the painter, but *one* work, harmonious throughout, and the joint result of two artists working *con amore* to effect the same end, the painter taking as much interest in the cornice and the other architectural features of the room as the architect took in them, and the architect feeling as much interest in the painting as the painter himself.

The Chairman, in closing the discussion, conveyed the thanks of the Conference to Mr. Armitage for his most interesting and valuable paper, which was one unique in character. The discussion had afforded the pleasing spectacle of painters and architects mutually striving in generosity towards each other as to the relative positions they ought to occupy in respect of works of art in which they were jointly engaged. If that were to be among the first fruits of the institution of the new order of Honorary Associates, as represented in the persons of Royal Academicians and other artists, it would be only one among many proofs of the extreme value of the services which that class of members was capable of rendering to the Institute. As to the cost of mural decoration, while it was necessarily impossible to arrive at any but the vaguest idea of the price of a work of art, it was enough to know that works of art of a kind far from despicable could be executed at the prices mentioned as having been paid to Delaroche and Flandrin; and it was not to be supposed that the painters of Munich were more highly-paid. He agreed with Mr. Armitage in thinking that architect and painter should be on an equality when they were jointly engaged on one and the same building. In the initiation of the general architectural design, the painter should have a voice just as the architect should have a voice, as to the character of the decoration to be carried out. In that way an *entente cordiale* of lasting benefit to both painter and architect would be promoted and effected. As to the questions of style, the "battle of the styles" was one which had been long in progress, and one which would, he supposed, continue to the end of time. But art was many-sided, and the same was true of architecture, as one branch of art. Champions of the different schools could, however, practise in their own styles without flying at each other's throats; and, as had been suggested, painters and architects whose predilections were akin would naturally consort together. He trusted that Mr. Armitage's paper would bear fruit in giving a powerful stimulus to the extended use of mural painting.

VISIT TO THE NEW LAW COURTS.

On Tuesday morning some 200 of the gentlemen attending the Conference visited the works in progress for the erection of the new Law Courts. The visitors were courteously received by the architect, Mr. Street, R.A., and, accompanied by him, they spent about a couple of hours in rambling over the buildings. The works appear to have made considerable progress during the past month, especially in and about the central hall. We must, however, defer for the present any detailed account of what the visitors saw. The architect explained many points as to the construction and planning of this large group of buildings, the progress of which towards completion has been much impeded by the recent strike of masons.

VISIT TO ST. PAUL'S CATHEDRAL.

On Tuesday afternoon a large number of the members of the Conference visited St. Paul's Cathedral, where they were received by Mr. Penrose (the architect to the Dean and Chapter) with his wonted courtesy. Assembling at the west end, the visitors first proceeded to view the still-incomplete Wellington Monument. Mr. Penrose spoke of it as being the work of many years' devotion spent by the artist (the late Alfred Stevens) in surmounting the difficulties of his task. The unfortunate blunder made in boxing-up the monument in such a confined space as the Consistory Court was condemned by many of the visitors in substantially the same terms as those of our recent protest.* On this head, Mr. Penrose said that it was originally intended to place the monument under one of the nave arches; but at the time that it became necessary to absolutely determine its site, the then Dean, who had inaugurated services for large concourses of people in the nave, deemed it undesirable to give up so much space in the nave to so large a monument; and as the Consistory Court was at that time beginning to fall into disuse for the purpose which its name implied, it was decided,—after conferences between the Dean and Chapter, the First Commissioner of Works, and the sculptor,—to appropriate it as the site of the monument. Such a position as that contemplated in the first instance, viz., under one of the nave arches, would have been, in Mr. Penrose's opinion, preferable, though such a position would have possessed the disadvantage that the piers of the nave would have stood in the way of obtaining end-views of the monument. Mr. Penrose gave a few particulars as to the construction of the monument, stating that through each of the marble shafts carrying the superstructure there ran a solid rod of copper 3 in. in diameter, for the purpose of tying the whole well together. The architectural part of the design was entirely Stevens's own. "I know of but one art," was his motto. He was a most beautiful painter, as well as sculptor and architect. Those who did not know of the versatility of his genius rashly predicted that though he might succeed in the general design of the monument, he would be unequal to faithfully portraying the lineaments of the Duke, but the prediction had been completely falsified.

Mr. H. H. Stannus (who had charge of the completion of the monument after the death of Mr. Stevens), at the instance of Mr. Penrose said a few words. He observed that Stevens was led to adopt the motto in question from the circumstance that Michelangelo was once asked which he considered to be the greatest of the arts, architecture, sculpture, or painting. He replied to the effect that there was but one art, of which those three were but different phases. Mr. Stevens had, with the generous instinct characteristic of a true artist, made his design of the upper part of the monument less perfect, perhaps, than he would have made it had he not desired to make it harmonise with that of the cathedral itself, which was vaulted from an attic story. This reticence and self-abnegation afforded a striking proof of the veneration felt by Stevens for Wren's masterpiece. As was well known, the monument had not yet been fully completed in accordance with the original design. It was to have been surmounted by an equestrian statue of the great Duke, but this was for the present omitted.† He (Mr. Stannus) purchased at the sale of Stevens's effects, and now possessed, the model made by Stevens for this statue, which, if ever carried out, would be a masterly work. It was an admirable portrait of the Duke as he was when about forty years of age, or, in other words, at about the time of the battle of Waterloo.

Mr. Penrose called attention to the bas-reliefs on the walls of the Consistory Court,—those on the eastern wall by Mr. Calder Marshall, and those on the western wall by Mr. Worthington. These bas-reliefs embody Scripture subjects which bear on the life and career of the Duke. In answer to questions by Mr. Charles Barry, Mr. E. C. Robins, and other gentlemen, Mr. Penrose said it was *not* intended to remove the screen which divides the Consistory Court from the nave, and which materially interferes with the monument when viewed from the nave. He admitted the desirability of reducing, by means of stained glass, the intensity of light pouring through the window on the south side; but although everybody wished to see this done, nothing was at present contemplated.‡

The visitors having ascended to the dome, inspected the internal timbers of the outer dome, which have within the last year or two been covered with a coating, 1 in. or 1½ in. thick, of Brannon's patent fibrous concrete. This material is composed of selenitic lime and cocoa-nut fibre, and the timbers are either wholly encased in it or are covered with it on all exposed surfaces. It is not applied directly on to the wood, however, a "key" being obtained by covering the timbers with fine wire-netting. In order to further guard against danger of fire, the space between the outer dome and the cone of brickwork which (it may be news to some of our non-professional readers to learn) is carried up between the inner and outer domes to carry the superincumbent stone lantern, has been divided by two partitions into separate compartments, these partitions being of oak studding 3 in. square, and covered with the same material. Mr. Penrose detailed some experiments which he had witnessed. These experiments were so conclusive that, at his instigation and under his direction, the Dean and Chapter had, in the way indicated, adopted Mr. Brannon's valuable invention.

Descending from the dome, a great surprise was in store for the visitors. In that portion of the churchyard which lies south of the cathedral, three or four shallow pits had been dug, revealing some interesting remains of Old St. Paul's. It appears that, a short time ago, some workmen, sinking a pit for some purpose connected with the gas-supply of the cathedral, came upon some masonry which suggested to Mr. Penrose the idea that if he had the ground opened in one or two places he might light upon some relics of the old cathedral. Choosing the spots by the aid of plans of the old cathedral, he had, in every instance where the ground had yet been opened, hit upon exactly what he thought it possible he might find. These investigations had brought to light considerable remains of the lower part of the south cloister, one portion found being attached to a piece of the wall of the south transept of the cathedral. Another important find is the lower part of one of the buttresses of the chapter-house. The investigations are, we understand, to be pursued. Meanwhile, Mr. Penrose is to be congratulated on his success. Prior to these discoveries, the only remains extant of Old St. Paul's were the four curious recumbent figures now in the crypt.

A visit to the crypt, with its well-known "Artists' Corner," * brought to a close a very interesting ramble in the Cathedral, rendered especially instructive by the fund of information which Mr. Penrose was so able and willing to afford to all.

VISITS TO DORCHESTER HOUSE AND BRIDGWATER HOUSE.

On Wednesday morning, numerous visitors availed themselves of the permission, kindly given to those attending the Conference by Mr. R. S. Holford, to visit Dorchester House, Park-lane.† The sumptuous marble staircase was of course an attraction in itself, to say nothing of the numerous pictures and other works of art.

In the afternoon, by the permission of the Earl of Ellesmere, a similar visit was paid to Bridgwater House, St. James's.‡

We have no space for an enumeration of the many and varied art treasures which these splendid mansions contain.

THE CORROSION OF IRON.

A Conference meeting was held on Wednesday evening, Professor T. Hayter Lewis in the chair, when Professor Barff read a long and interesting paper on "The Corrosion of Iron." We shall give the substance of this, together with a report of the discussion, next week.

VISIT TO THE NATURAL HISTORY MUSEUM.

On Thursday morning a visit was paid to the new Natural History Museum, South Kensing-

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* *Builder*, p. 456, *ante*.

† A large view of the complete design was published in vol. xxxiii (1875) of the *Builder*, pp. 688, 689.

‡ The glare of light is so strong that, as already pointed out in the *Builder* (in the article before referred to, p. 456, *ante*), the monument, when viewed from the nave has the appearance merely of a black mass, the details being unseen.

* A view of this hallowed corner of the building appeared in vol. x. (1852) of the *Builder*, p. 591. Here lie buried, not only Sir Christopher Wren himself, but Sir Joshua Reynolds, Sir Thomas Lawrence, Opie, Fuseli, J. M. W. Turner, Sir Edwin Landseer, and other artists of fame.

† This mansion, of which Mr. Lewis Vulliamy was the architect, was illustrated in vol. x. of the *Builder*, p. 551.

‡ Sir Charles Barry, architect. Illustrated in the *Builder*, vol. vi. (1848), pp. 451, 474, 475.

ton,* under the guidance of Mr. Alfred Waterhouse, the architect. We shall give some notes of this visit next week.

GENERAL BUILDING REGULATIONS FOR THE UNITED KINGDOM.

A conference meeting was held on Thursday afternoon, Mr. J. Whichcord in the chair.

Mr. J. Douglass Mathews read a paper on "The Model Bye-Laws as the Basis of a General Building Act." He said,—

At the last general Conference of Architects held in 1876, the subject of General Building Regulations was introduced in a paper by Mr. Honeyman, of Glasgow, in which he called attention to the unsatisfactory state of the present system of building requirements, and the desirability of a Building Act to apply generally throughout the United Kingdom. Mr. Clarke, of Liverpool, followed with a paper bearing on the same subject, pointing out some of the defects in the Liverpool Building Act, and suggesting that the general Act should embrace sanitary as well as building requirements. The desirability of promoting a uniform system of building, as far as possible, throughout the kingdom, having been admitted, I will not take up time by further introduction, except to say, that if further proof were necessary, at the time the Conference was taking place the Local Government Board had under its consideration a code of bye-laws, which was proposed to be issued for adoption by local sanitary authorities, constituted under the Public Health Act, 1875, dealing with the subject in much detail. It is only right that I should mention that the Conference meeting concluded with the following resolution :—

"That the Council of the R.I.B.A. be requested to appoint a committee to consider the subject of General Building Regulations for the United Kingdom, which shall communicate with the provincial architectural societies and the Local Government Board and report at the earliest period to the Council."

The Council of the R.I.B.A. acted on this suggestion, and put themselves in communication with the Local Government Board, who at once accepted the services offered, and sent proof copies of the proposed bye-laws, with a request that they should receive the consideration of the council. The several architectural societies having been communicated with, a committee was formed, under the presidency of our chairman, and a great number of meetings considered very fully the proposed bye-laws in detail, making such alterations and amendments as they considered necessary. These were reported to the Local Government Board, and shortly after the bye-laws were issued in their present form, some of the suggestions being embodied therein.

At the outset let me explain that these bye-laws are prepared and issued in accordance with section 157 of the Public Health Act, 1875, which gives to Urban Authorities powers to make bye-laws as to the construction of new streets and the sewerage thereof, the structure of walls, foundations, &c., and chimneys, the sufficiency of space around buildings for securing ventilation, and the drainage of buildings and the closing of buildings unfit for human habitation. To ensure uniformity of requirements and the proper supervision that they may be satisfactorily carried out, the bye-laws have been issued as a model by the Local Government Board, and it is the desire that, in course of time, the various bye-laws in force in different parts of the country may be exchanged for the new and approved ones, and perhaps even before this is accomplished the need of a Building Act to apply generally will be considered so desirable, that the bye-laws will give place to an Act of Parliament to regulate all buildings throughout the country.

I feel myself at some disadvantage in bringing the subject under your notice, having very recently read a paper on the proposed bye-laws before the Architectural Association,† but I propose now to treat them especially as applicable to the purposes of a General Building Act.

It appears desirable that a Building Act should deal with all matters appertaining to building, so that from the laying out of a road to the plastering of the walls of the houses built therein, the provisions should be clearly understood by all the parties concerned, and the administration should be in the hands of one authority; and although in the larger towns the supervision could be placed in the hands of two or more officers, in smaller towns it could be undertaken by a single officer, as it is of consequence that the official expenses in carrying out an Act of this kind should be as moderate as possible.

The purposes of a Building Act being for the maintenance of public health and safety it should contain provisions for :—

1. Laying out and constructing new streets and sewers.
2. The construction of buildings, including foundations, walls, chimneys, and other things to insure stability of construction and protection from fire.
3. Suitable means for rendering buildings healthful and insuring proper ventilation and fresh air.
4. The arrangement of drains and closets and water-supply thereto.
5. The construction of public buildings.
6. The rights and obligations of neighbours in reference to party-walls.
7. The removal or amendment of dangerous structures.
8. The administration and enforcement of the law.

I propose, in the briefest manner possible, to bring before you the chief provisions of the bye-laws, and to offer a few suggestions as to their adaptability for a general Building Act; and I may remark generally that the bye-laws appear to be conceived in a somewhat arbitrary spirit, for although it is of the greatest importance that in London and large towns where speculating building is carried on to a considerable extent, every means should be taken to enforce good building; yet if the Act is to be general, this class of building in many places is the exception rather than the rule, and therefore care must be taken not to impose needless requirements or to fetter the conscientious builder more than is necessary, otherwise the difficulties will be so great in enforcing it that in time it will practically become a dead letter, as is the case with many of the present local Acts.

One great defect in the bye-laws is that they do not apply to alterations to old buildings, which of necessity must be remedied in a general Act. In the case of new streets, it is provided that they shall be formed at easy gradients and suited to the adjoining streets. That all carriage-roads shall be 36 ft. wide, at least, except where the street is less than 100 ft. long, in which case it may be 24 ft. at the least, and that every street shall be opened at one end at least the full width. That alleys or passages at the back or sides of buildings to prevent ashes, soil, and refuse being carried through the house, may be formed of any width. Details are given as to the curve and width of the roadways, and the inclination and width of footways and heights of kerb; and also that no building shall be less than 24 ft. distant from the boundary of any lands or premises opposite thereto.

The law which allows streets 100 ft. in length to be 24 ft. wide, although of much value when such are only intended as approaches to two or three houses, has been found to work badly in the metropolis, as streets have afterwards been formed of the full width required, the approaches being only 24 ft. wide. The provision requiring one end only of a street to be open seems hardly consistent with other laws for ensuring ventilation and the circulation of air.

The Public Health Act, in addition to the foregoing, includes provisions for the regulation of streets, as to their construction, paving, and sewering; powers to purchase premises for the improvement of streets, and to regulate the line of buildings and projections therefrom. The Towns Improvement Clauses Act also contains provisions for naming streets and numbering houses, improving the lines of streets and removing obstructions, all of which should be collated and embodied in a general Building Act.

For the construction of buildings, including foundations, walls, chimneys, and other things, to ensure stability of construction and protection from fire, the bye-laws require that the footings of every wall shall either rest on the solid ground, or upon a sufficient thickness of good concrete, or upon some solid and sufficient sub-structure as a foundation; that all walls shall be constructed of good bricks, stone, or other hard and incombustible materials, with good mortar composed of good lime and clean sharp sand, or other suitable material, or good cement, and the walls to be of the thicknesses proportionate to their length and height, which are in most cases greater than the requirements of the Metropolitan Building Act, which for many years past has been found sufficient in practice.

Walls may be divided in their length by means of return or cross-walls, which must be carried to the top of the topmost story, and be of the thickness equal to two-thirds that of the external and party-walls, and solid for at least two-thirds the area. This also is in excess of the Building Act, which allows the cross walls to be two-thirds the height of the main walls, and open for one-half the area, which as a rule is quite sufficient to form a good tie to the outside walls.

The sets-off to the walls are taken to the top of each floor instead of to the underside, and the heights of the stories are measured in a similar manner; the reason is not apparent, and the result is, that floors enclosed with walls less than 14 in. thick cannot be more than about 9 ft. 4 in. in height, although 10 ft. are allowed in another clause. Provision is made to obtain higher stories than sixteen times the thickness of the walls in houses and fourteen in warehouses, by means of piers equal to one-fourth part the length of the walls; or as buttresses, if an equal area is obtained by greater projection. Permission is also given for openings more than half the area of the wall in each story by providing sufficient piers of brickwork or incombustible materials. If the walls are built of stone, or of clunches of brick, or other burnt or vitrified material, the beds or courses not being horizontal, the thicknesses shall be one-third greater than bricks.

No provision is especially made for the use of concrete as a building material, except that if a wall is built of other suitable material it may be of the thickness prescribed for brickwork; but this leaves a wide door open for the use of concrete or other material of an inferior description, and unless the suitability of the material can be readily determined, would be productive of considerable difficulty. It is required that, in addition to the bearing on the walls, bressummers shall be further supported, where necessary, on story-posts, iron columns, or other supports.

As a precaution against fire, the bye-laws provide that all woodwork shall be set 4 in. back from the face of the wall, except for loophole doors; that the external walls of all buildings within a distance of 15 ft. from any other buildings shall be carried up to form a parapet; that party-walls of warehouses and public buildings shall be carried above the roofs 3 ft., and in other buildings 15 in.; that no plates or timbers be built in party-walls, and no timbers bear thereon nearer than 4½ in. to the centre line; that the open space inside all partition walls (*i.e.*, between the quarters) and also between the joists in any wall shall be stopped with brickwork, concrete, pugging, or other incombustible material.

The requirements for flues comprise provisions for building and properly bonding and corbelling under certain circumstances. Formation and pargetting of flues, and carrying the same up to a height of 3 ft. above the roof. The thickness of the brickwork to be 9 in. for furnaces, cockles, steam boilers, close fires, cooking ranges and apparatus, to a height of 10 ft. above the floor. The backs of fireplaces of kitchens to be 9 in. thick to a height of 6 ft. above the chimney openings. All arches over chimney openings and arched chimneys to have wrought-iron bars, with some exceptions. All woodwork to be kept a safe and definite distance from chimney openings, flues, and smoke-pipes; and that all roofs, dormers, turrets, and other erections on roofs shall be covered externally with incombustible materials. No provision is made in the bye-laws for the construction of hearths and flues; these, with other requirements, being comprised within the Chimney Sweepers Act, which is incorporated with the Public Health Act, but should be detailed in a general Building Act; and, in fact, if the provisions of the Metropolitan Building Act were adopted generally it would be well, as experience had proved them satisfactory.

In some of the Local Acts, as well as in the bye-laws of some towns, a table of scantlings for joists, beams, roofs, and other buildings is given; and as so much of the stability of a building depends on the construction of floors and roofs, it would appear desirable that some carefully-considered tables or schedules be in-

* Illustrated in *Builder*, vol. xxxi., pp. 10, 28. Described, vol. xxxiv., pp. 120, and present vol., p. 83, *ante*.

† *Builder*, pp. 314, 387 *ante*. The bye-laws have also been fully commented upon in the *Builder*, vol. xxxv. (1877), pp. 970, 996, 1118. We ought to state that the exigencies of space have compelled us to curtail Mr. Mathews's paper,

cluded; and as the use of iron in buildings is now so general, some tables or formulæ for determining the size and section of iron joists, girders, columns, story-posts, &c., might well be added. The difficulty in preparing and enforcing such tables would, however, be very great, because so many special cases would arise that they would not always apply; and as the qualities of the materials used would differ, such tables might either be attended by danger, or else, to guard against such a result, the requirements might become arbitrary.

The provisions in the bye-laws to promote health and sufficient light and ventilation, are as follow:—That no building shall be erected on ground impregnated with animal or vegetable or fœcal matter, until such matter has been removed. That a layer of cement concrete 6 in. thick, or a coating of asphalte, be spread over the whole ground surface of a building. That a damp-course of lead, asphalte, slates in cement, or other durable material, be laid in all walls, not less than 6 in. above the surface of the ground adjoining. That all walls shall be properly coped, or otherwise protected, to prevent water from running down the wall or soaking therein. That in the lowest story of a building provided with a boarded floor there shall be a clear space of at least 3 in. under the joists for ventilation, and air-bricks provided for this purpose. Most of these provisions are new in the metropolis, and although very desirable, would in their present form, I fear, be found unworkable. . . . . .

For the purposes of ventilation and free circulation of air, the bye-laws provide that in the rear of all buildings there shall be a clear open space above the level of the ground of at least 150 square feet, which shall run the whole width of the building, and be in no case less than 10 ft. wide between every part of such building and the boundary of lands and premises adjoining. If the height of the building be 15 ft., then a space 15 ft. wide shall be given, and so on up to 25 ft. wide, if the building is 35 ft. or more in height; and no alteration in any building shall at any time be made which will interfere with the foregoing dimensions.

These requirements may be desirable to obtain a sufficiency of pure air, and may be practicable in small towns where land is not very valuable; but I venture to think that if these laws were embodied in a General Building Act in such places as Manchester, Liverpool, and other large towns, it could not, in the great majority of cases, be carried out, as it would require for an ordinary shop and dwelling-house, with rooms built out in the rear, a plot of land of at least 32 ft. 6 in. frontage, and 75 ft. deep. This restriction would also prevent the use of the entire ground floor for trade purposes.

Other provisions for light and ventilation are, that all rooms shall be lighted direct from the external air by windows at least one-tenth the area of the room, with one half to open to give top ventilation. Either a fireplace should be constructed in every habitable room, or an aperture or air-shaft of at least 100 square inches formed.

For the proper ventilation of closets, it is required that all closets should be placed against external walls, and provided with a window not less than 2 ft. by 1 ft., and adequate means of ventilation obtained either by an air-brick, air-shaft, or other approved method. Water-closets lighted by skylights and provided with top ventilation seem to be ignored.

The provisions for drainage and water-closets are prepared with great care, and as they are based upon a principle the very opposite to that formerly employed, there will be difficulty in getting them readily adopted. Instead of hermetically sealing drains and cesspools, it is proposed that as much air as possible is to pass through them; and soil-pipes and all cesspools are to be properly ventilated. All damp subsoils and the lowest stories of all buildings are to be drained into a sewer. The pipes are to be glazed stoneware, and where laid as soil-drains to be bedded in concrete. Main drains to have a trap as near the entrance to the sewer as practicable. No drains inside a house to have any inlet other than from a water-closet or slop-sink, and all overflow-pipes to discharge externally over an open trapped grating.

All closets to be provided with a separate cistern or other means of supplying the closet with water other than directly from the cistern used for the supply of drinking-water.

The position and construction of earth-closets, ash-pits, privies and cesspools are provided for in a very detailed manner; but whatever their value as bye-laws, sanitary science can hardly be said to be so thoroughly understood that laws now made will of necessity be the same in twenty years' time, and therefore it is undesirable to incorporate them in a Building Act, which should be so drawn that constant amendments should be unnecessary. . . . .

It appears to me that the medical profession have had a little too much their own way in framing these clauses, and, therefore, instead of embodying these or other clauses in the Act, powers to make bye-laws should be given to each Local Authority, subject to the approval of the Secretary of State, which would leave each town free to adopt what may be considered the best sanitary improvements.

The construction and inspection of drains can hardly be said to come within the scope of a General Building Act, and in large towns it would no doubt be placed under the care of an officer distinct from the building surveyor; at the same time, as the health and comfort of a house depend as much on the proper construction and working of the drains as in any other part of the building, it is of the utmost importance that special supervision should be bestowed by a proper qualified official, and in small towns, where there is not sufficient work for more than one officer, he would no doubt be required to fulfil both duties.

But I venture to think, whatever be the requirements, and however careful may be the supervision, unless there is a very great improvement in the present laying and connecting of drains, all these precautions will be comparatively useless; and I strongly advocate that the whole of the works connected with house-drainage should be executed by a person who should make this his special work, and be responsible, under a heavy penalty, for the works being properly carried out; and that such persons should receive the special licence from the local authorities, or else that the authorities themselves should execute these works, and charge the cost to the owner. I should prefer the latter course, because the whole system of public and private drainage would be in the hands of the local authorities. A plan of the drains of every building would be registered, and the works be executed under a schedule of prices which would not bear unduly hard on the owner. . . . .

It is manifest that in all towns the construction and supervision of buildings used as churches, chapels, hospitals, workhouses, schools, theatres, concert, ball and lecture rooms, and other places where the public congregate, should receive most careful consideration, and either a General Building Act should contain detailed laws applicable thereto, or else that a competent authority should have power to supervise them, subject, in case of difference, to an appeal. I think the latter course would be the better, because the requirements would differ in almost all cases. . . . .

It has unfortunately happened in many cases where temporary buildings have been erected for public processions, races, &c., that loss of life has occurred in consequence of the careless and ignorant manner in which stages and platforms have been constructed, and to prevent further accident it is desirable that in a Building Act provision should be made for special supervision, so that before any structures are used for public purposes a licence should be obtained, and the responsibility of sound construction thereby rest on some official person.

In the face of so much litigation relative to party walls and structures, and the joint rights of building and adjoining owners out of the metropolis, it is very desirable that a general Building Act should include provisions determining the rights of the respective owners; and although it often happens in towns that each house has its own wall or partition, where the area is limited and the ground proportionately valuable, this practice must be abandoned in favour of party-walls, and the advantages in point of expense and room will nevertheless outweigh the occasional difficulty and litigation attending such structures.

That portion of the Metropolitan Building Act which deals with party structures was drawn with much care, and, considering the many and difficult cases in the metropolis, the provisions may be considered to meet the requirements, and therefore their adoption in the proposed Act is suggested. In this Act certain rights are given to the building owner to deal with the wall or structure in such a manner as to make it suitable for the purposes of his new building, subject to proper notice being given to the adjoining owner, who has the power to object if the works proposed are not absolutely necessary, and in the case of disagreement the matter to be referred to a third surveyor, who shall prepare an award which shall be binding on both parties, subject to an appeal to the county or a higher court. It also deals with the manner the work is to be carried out and the proportion of the expense to be borne by each owner.

In smaller towns, where land is not very valuable, it may be better to build each house with its own walls, whereby independence is insured, which cannot be the case if there is but one wall between two houses, and to prevent loss of ground the bye-laws meet the case by allowing the omission of footings if they adjoin another wall.

The removal or amendment of dangerous structures and ruinous buildings should certainly be dealt with in a general Building Act, and although provisions are contained for this purpose in the Towns Improvement Clauses Act of 1847, they should be embodied in the general Act. The provisions in the Metropolitan Building Act may be taken as a basis. . . . . .

To insure the Act being properly carried out, it is necessary that sufficient information be given to the authorities by the parties building to explain their intentions; that properly-qualified officers be appointed to supervise and direct the works in accordance with the Act, and provision made for their remuneration; and also that simple means may be adopted to enforce the law being properly carried into effect. . . . . .

The administration of the bye-laws is entrusted to the Local Sanitary Authority, which is more or less subject to the Local Government Board, and can hardly be said to be an independent body. However advantageous this may be in the case of small towns and unions, I think that in large towns where an Act of Parliament would generally apply, the corporation or other elected local body should be charged with the sole power to administer the Act; for although in some things centralisation may be good and advisable, yet if the power of conducting its own business is withdrawn from each town, local interest and pride will in a great measure be lost, and I much doubt whether the results obtained in the administration of the Poor Law and other matters where central authority supersedes local, it is sufficient to justify the curtailment of rights and privileges hitherto enjoyed by citizens; and therefore, as the Metropolitan Board of Works is the sole authority to carry out the Building Act in London, so also should the local corporations do the same in their respective boroughs.

An important duty devolving on the authority, whatever it may be, is the appointment of suitable persons to see the Act is fully and properly carried out, and, at the risk of differing from many, I think this can be better and more efficiently performed by an independent person rather than by a salaried officer, and especially if such officer should be empowered to sanction plans for public buildings, dangerous structures, and other things requiring more than ordinary information, or to place him in a superior position to practising architects. In some places it would doubtless be found difficult to procure the services of an architect who could or would properly discharge the duties required, in which case it must rest with the authority to appoint an officer; but this should be the exception rather than the rule. In any case the surveyor should be thoroughly qualified and be duly examined and certified, and the payment of supervision made by fees rather than by salary, and thus place the cost of supervision on the person building rather than on the rates, as at present adopted in local boards.

It will be found in all towns, notwithstanding the utmost utmost care in drawing up an Act of Parliament, that there will be many things where the Act would become too arbitrary if rigidly carried out, or would not meet the purposes intended, and therefore a power should be given to the corporation or other authority to modify the Act in certain particulars, which, if necessary, may be defined. If it is found that even more latitude is required, or an appeal is demanded from the authority, a Board of Appeal might be formed in London, composed of properly-qualified persons whose decision should be final and binding on all parties.

For the enforcement of the general provisions of the Act, summary proceedings taken before a Justice have been found to work fairly well in

the Metropolis, and the provisions of the Metropolitan Building Act should be embodied in a general Act for this purpose, and in case of appeal I would suggest that the Board of Appeal just mentioned might be constituted as the proper authority. . . . . .

Short papers by Mr. Boult (Liverpool) and Mr. Honeyman (Glasgow) were also read.

We shall next week give some notes of these, and of the discussion which ensued.

CONCRETE AND FIRE-RESISTING MATERIALS.

A CONFERENCE meeting was held on Thursday evening, Mr. George Godwin in the chair, when Mr. Arthur Cates, Fellow, read the following "Notes" to open the discussion on this subject:—

In the first volume of the "Transactions of the Royal Institute of British Architects," there appears the Prize Essay upon "The Nature and Properties of Concrete," by George Godwin, jun., Associate. In more recent years, the attempts to use cement concrete as a building material for ordinary constructions, in many cases attended with remarkable success, required consideration; and on June 5, 1871, Mr. Thomas H. Wonnacott, in a paper "On the Use of Portland Cement Concrete as a Building Material," fully described the advance which had been effected. Mr. A. W. Blomfield at the same time contributed "Remarks on Concrete Building." The continually increasing importance of the subject led to its being further considered in 1876, when, on April 10, Mr. Alexander Payne read before the Institute an exhaustive paper on "Concrete as a Building Material": in this paper, and the succeeding discussions, continued on May 15 and May 29, a large amount of valuable information will be found. The advance that has continued to take place in the application of concrete, and the importance that attaches to an interchange of opinions and experiences of its use, have induced the council to select the subject for consideration this evening. In the discussions referred to, numerous instances of remarkable success were given, especially in the construction of floors, such as plate floors, 12 ft. 6 in. by 11 ft. 6 in., of a uniform thickness of 7 in., bearing 4½ in. on walls, without girders, iron or other supports; a plate floor, 20 ft. by 15 ft., 6 in. thick, loaded with 2 cwt. to the foot, without deflection; a balcony, 50 ft. long, 4 ft. projection from the wall, 11 in. thick at the wall, and 3 in. thick at the outer edge, supported merely by the adhesion of the cement to the wall. The success which had attended these bold experiments led to the anticipation that even more striking successes might be obtained; and, should time permit after the discussion of the more important section of the subject—Fire-resisting Constructions—it is to be hoped that full advantage will be taken of this opportunity, and the results of experience since 1876 be freely communicated, not only with regard to such exceptional feats, but especially with relation to—

The formation of walls for ordinary constructions, whether solid or packed with large fragments in the interior.

The use of iron bonds or ties in particular situations.

The homogeneity of concrete structures: their liability or otherwise to vertical fissures, or to splitting up into sections.

The damp-resisting qualities of different descriptions of walls; the conditions under which they are weather-proof without external rendering.

The liability in certain atmospheric conditions to condensation of moisture inside the building.

The sonority of such structures; if any inconvenience is found to arise from the free conduction of sound, more particularly where the walls, floors, and roofs are constructed of concrete; and details of the remedies found to be effectual.

The adoption of any less expensive material than Portland cement, such as selenitic lime.

The external decoration of the wall surfaces.

Ascertained facts as to the comparative advantage of different kinds of apparatus and cost of work.

The other branch of the subject for consideration,—fire-resisting constructions,—has, since 1854, when the French systems and Fox & Barrett's patent were discussed, been frequently considered by the Institute. Professor T. Hayter Lewis, in a paper read April 3rd, 1865, summarised preceding experiences; and from them the following conclusions were drawn:—

1. Iron is unsafe owing to the risk of fracture, and the loss of strength attendant upon great heat.

2. Stone and other substances known to be incombustible are not therefore fireproof, but, on the contrary, their use, as they are commonly applied, is often the source of great danger.

3. Concrete in which silicious material is used is readily destroyed by fire; fire-resisting capability can only be attained by the use of material which has already been calcined, such as clinkers, broken brick, broken pottery, stamped or ground up, and similar material.

The subject was further considered at the Conference Meeting of May 25th, 1871, in the discussion following papers read by Professor Lewis and Mr. Charles Fowler, and in the published reports of these proceedings very valuable details will be found. Since this period very great attention has been devoted to the subject, and it may suffice on this occasion if I briefly refer to those few systems which appear to me to be most worthy of consideration.

Mr. Matthew Allen, in his patent for fireproof buildings, dated January 30, 1862, had described his improved method of making fireproof buildings by the combination of cinders, slags, coke-clinkers, or other calcined substances with Portland or other cement, and he has largely carried out this principle in the lintels and stairs of the numerous buildings in the erection of which he has been concerned. His material was subjected to a severe test in 1871, when a six-story building erected for Messrs. Waterlow & Sons in Hill-street, Finsbury, was partially destroyed by fire. In this building his improved concrete had been used for lintels over double iron doors, in party-walls, and over all door and window openings; by the fire the iron doors, columns, girders, floors and roofs, and all the ordinary stone-work, were destroyed, and even the granite paving of the court-yard was considerably damaged. York landings, 3 ft. by 8 ft. and 6 in. thick, forming the cills under the iron doors, were entirely destroyed, while the concrete lintels above, which had been exposed to a much fiercer heat, were quite unhurt. This remarkable success led to the adoption of this material on a large scale in the new buildings erected by Messrs. Waterlow, where the floors are formed of concrete 7 in. thick, and all the girders and ironwork of the floors are inclosed in this material. Concrete thus prepared has not only great fire-resisting power, but it is otherwise strong. Mr. Allen having used it for templates, bases, &c., and using 5 parts of clinkers to 1 of cement, he has found templates 18 in. square support a load of 170 tons without perceptible effect. For ordinary purposes Mr. Allen uses a proportion of 8 to 1, or, where greater strength is required, 6 to 1. He also recommends that the bottom flanges of all girders should be bound round with wire and covered with the material to protect them from fire; and that pieces should be cast to fit round columns, or iron wire being bound round to form a key, the material should be worked round in the ordinary manner.

The necessity for efficiently protecting the iron beams which constitute the element of strength in ordinary floor constructions, although so clearly demonstrated in 1865, did not, so far as I am aware, receive a practical application till about 1873, when Mr. John Whichcord, at the National Safe Deposit Company's Building, Queen Victoria-street, having for the exterior selected "Minera" stone, as a sandstone promising satisfactory fire-resisting power, next proceeded to devise a really fireproof floor; and as the requirements of the superstructure did not admit of any internal wall, and the points of support by columns were limited to two or three, there was no alternative but to employ iron girders for supporting the arches of the floor; to protect these from the action of fire, Mr. Whichcord devised a fire-brick and clay-casing inclosing the flange, and by actual experiment (detailed in his paper read January 17th, 1876) on a girder 14 ft. 9 in. span, the protection was found to be sufficient, the girder so protected resisted fire for long periods, remained uninjured, and was used in the building. The iron columns were protected in a similar manner, and thus the first practical step to the production of a really fire-resisting structure was made.

Mr. Lewis Hornblower, of Liverpool, patented in 1871 and 1873 a system which appears to be somewhat complex, and which he calls the "Cellular Terra Cotta Fireproof Girder Floor," in which the rolled iron joists, about 2 ft. apart, are cased with hollow skewback springing tiles of fireclay filled in with concrete, the interspaces being filled in with hollow voussoir-shaped tiles, and the whole floated in with liquid cement or concrete. This system has recently been adopted by Messrs. Pennington & Bridgen in the erection of the Manchester Pantechnicon. For a room, 24 ft. by 24 ft., the cost is stated to have been 25s. per square yard. A similar floor at the Liverpool Corn Exchange, 27 ft. 6 in. span, cost 32s. per square yard, fixed complete. I understand, also, that Mr. Honeyman has used this floor in some four instances.

In 1876 Mr. Northcroft obtained a patent for a more elaborate system, by which all girder- and joists would be completely encased in fire clay tiles or blocks, and the interspaces filled in with similar tiles or blocks voussoir-shaped, and joggled together in such a manner as to form a flat soffite and upper surface.

The protection of columns is not less important than that of girders, but beyond the suggestion of Mr. Allen, and the actual work of Mr. Whichcord as before mentioned, they appear to have been in some degree neglected by inventors; in 1877, however, a patent was granted to Mr. Lake, on a communication from Messrs. Drake & White, of Chicago, for the protection of iron columns against the effects of fire and the effect of water on heated iron columns in burning buildings, by surrounding such columns with fireproof cores of terra cotta, concrete blocks, or other non-conducting material forming an annular exterior, filled in and grouted with cement; this appears to be very much what was done by Mr. Whichcord some four years ago.

To illustrate the slowness with which knowledge of the first principles of fire-resisting construction has spread, and the absolute necessity for the subject being considered and discussed at meetings such as this, I may refer to a patent obtained in 1876 by a gentleman describing himself as an engineer,—"for improvements in the construction of fireproof and other buildings,"—consisting of the formation of the floor arches as three sides of a polygon, in place of circular segments, the illustrative diagram showing the *exposed bottom flanges* and *tie-rods*, which render such construction anything but fireproof. These few instances hardly illustrate the energy with which inventors have recently turned their attention to fireproof structures, about as many as eighty patents having been granted in the last five years as so bearing on the subject; the majority, except those I have mentioned, and those of Mr. Brannon and Mr. Hyatt, being of very small importance. Many hope to obtain success by the circulation of water through hollow walls and floors; others by making the roof and floor shallow tanks, ever ready to discharge their contents on all below, by providing every compartment of a building with a central rose, connected with a large reservoir; by perforating the entire ceiling connecting it with a water-tank; or by perforated tubes connected with the street mains, and distributed over the building in such positions as to command the whole or any part. And on the occurrence of a fire to automatically bring the water to bear upon it; but all these devices are foreign to the subject for consideration this evening.

Among the active patentees, Mr. Philip Brannon deserves special mention; his inventions all merit careful consideration; the successful experiments in which buildings constructed of his material have resisted fire, and its apparent non-conducting powers, are probably familiar to all. The application of concrete in the form of so-called "stone felt," to the production of doors appearing likely to form far more efficient protection from fire than it has obtained by the familiar iron door, deserves more attention than it has received; and the application of the same material for the protection of that portion of the timber framing of the cupola of St. Paul's accessible to the visitors, which has been inspected this week by the members of the Conference, reflects great credit on Mr. Penrose for having adopted it, and on Mr. Brannon for having so well carried out the work.

Mr. Lascelles is also working in the same direction, or rather, is advancing far beyond what has hitherto been done; and as a result of the endeavours of these gentlemen we may now erect a comfortable residence, in which combustible material, even in the fittings, shall be the exception,—the joinery, doors, window-frames, and all, being in concrete.

The inventors who have taken up this subject appear in many instances to be merely groping their way, and it is but seldom that their patents are the results of, or are supported by, well-considered and systematic experiments; and to this deficiency of scientific application the slowness of the progress hitherto made may be mainly attributed.

However, the most recent, and in some respects probably the most important, contribution to the literature of fire-resisting construction, is the well-illustrated volume printed last year for private circulation, by Mr. Thaddeus Hyatt, whose lens lights and pavement-illumi-

nators are so well known, and who has obtained a large number of patents relating to the subject. This essay is entitled,—"An Account of some Experiments with Portland Cement Concrete, combined with Iron as a Building Material, with reference to economy of metal in construction, and for security against fire in the making of roofs, floors, and walking surfaces," by Thaddeus Hyatt, which I thus summarise :—

Commencing by a review of the systems of so-called fireproof constructions as illustrated by Fairbairn,—"On the application of cast and wrought iron to building purposes," 4th edition, 1870,—Mr. Hyatt repeats what has been thirteen years ago urged in this room, that the original mistake as to the ability of naked iron to resist heat and flame has vitiated every floor construction of the kind; leaving out of account the unprotected iron columns on which the girders rest; the bottom flanges of all the girders are naked and exposed to flame; this flange being the tie, the integrity of the whole beam is dependent on it; soften the tie by heat, the resistance of the beam begins to give way, and the destructive influence of combined load and flame act till the beam is destroyed, and he arrives at the conclusion already attained by Whichcord, Hornblower, and others, that fireproof floors cannot be made if the bottom flanges of the beams are left exposed or too lightly covered.

To make fireproof floors it is necessary to know the law of heat conduction: with respect to the material relied upon to protect the bottom flanges of the beams, in order to calculate the thickness of material needed to give protection during the hurry determined on as the limit of time for the fireproof capacity of the floor; in a floor where the sole or main reliance for strength is in iron, the first thing to be done is to protect it with a fireproof coating on all sides sufficient to give it a power of resisting fire during the number of hours required.

In the Lens-light Works, Farringdon-road, an experimental building for the display of his inventions, and well deserving of a visit, Mr. Hyatt has introduced the construction shown on the diagrams.

With regard to the fire-resisting capabilities of Portland cement concrete, experiments were made with brick-shaped blocks, composed of one part cement to two of crushed bricks. At one month old, when heated to redness for six hours in a furnace, taken out and partially plunged into water, the end that came in contact with the water fell instantly to pieces and disappeared; similar blocks heated in the same way, and left to cool in the open air, became disintegrated within periods varying from six to forty-eight hours, the results being uniform as to samples that had been exposed to the same degree of heat and for the same length of time.

With a view to reduce the amount of iron in the construction of a floor, Mr. Hyatt proposes to utilise the power possessed by concrete of resisting compression in combination with the tensile force of iron, by omitting the web and upper flange of the iron beams usually employed in floor construction, and leaving only a tie bar 2 by ¼, and a series of experiments on concrete beams made on this principle, and varying in weight from 200 to 900 lb. each, the bearing being 5 ft., appear to confirm his theory; about fifty such beams were broken by Mr. Kirkaldy, and the results appear to show that the iron was perfectly held while the beam was under strain, and that the two materials worked in perfect harmony, and that the union of tie metal with concrete equalled in strength rivetted or rolled beams.

Not finding satisfactory results from the use of ordinary cement, Mr. Hyatt, having invented an improvement in the manufacture of Portland cement, which increased its fire-resisting capabilities, used such new cement in the following experiments:—To ascertain the length of time required for heat to penetrate concrete layers of different thicknesses, a furnace was built, the top of which consisted of a slab of concrete of three different thicknesses, a flat bar of iron being let into each step with the effect of leaving 2 in., 3 in., and 4 in., respectively under the bars, two small squares of metal, lead, and tin, were let into each bar, and needles made to rest thereon, so that on the melting of the metal the needles should sink. From the observations taken, the Thermal Chart exhibited was constructed, showing that, in three hours after the fire was lighted, the iron, protected by 2 in. of concrete, was at 250 deg., in five hours it was 650 deg., at the end of twelve hours 900 deg., or red-hot in the dark; while the iron protected by 4 in. of concrete did not, in five hours and a half, exceed 212 deg., in eight hours and a half, 450 deg., and at the end of twelve hours, 550 deg., or less than the melting point of lead.

A more complete test of the action of fire and water on an actual floor-section was made on a slab 6 ft. long, 2 ft. wide, and 7½ in. thick, supported at the extreme ends only. The tie metal in gridiron form was placed at the middle of the thickness, 3 in. of concrete being above and 3 in. below; a load of 300 lb. to the foot over the whole surface was obtained by bricks piled up, the deflection under this load for a span of 5 ft. being 1-32nd of an inch; the fuel was arranged to form an incandescent bed 6 in. thick, at 1 ft. below the under face of the concrete slab; the fire being kindled at six o'clock in the morning had by eleven become an intense heat perfectly uniform over the entire surface, and the bottom of the concrete was also at a glowing red heat all over; at this intensity the fire was kept up till four p.m., when the slab deflected 3-8ths of an inch; a stream of cold water was now thrown forcibly against the bottom of the slab for some twenty minutes and the load was then removed; the under side of the slab was uninjured, and the next morning, the slab being entirely cold, the deflection had disappeared. A second trial was made; during the firing the slab deflected as before, but the load was left upon the slab, which upon cooling returned to its original level, lifting the load with it.

This brief summary of Mr. Hyatt's treatise is sufficient to show its value and importance, and to suggest the expectation that experiments so well conducted will be renewed, and further important results obtained.

There is one material to which I have not yet alluded, and whose merits as available for fire-resistance have not received universal recognition—it is wood. For, although in large fires timber posts and girders have sustained comparatively little injury,—while iron columns and girders, thought to be "fireproof," have been utterly destroyed,—any form of construction in which the angles and edges of the wood were protected from fire action was not devised till Mr. Hyatt's patents of 1871 and 1873, who, adopting the principle that to use timber in a way to have it fireproof, it is only necessary to have enough material prepared to lay the timbers side by side, so as to expose to flame only the upper and under surface. In 1876 Messrs. Evans & Swain obtained letters patent "for the construction of floors and roofs of great strength and simplicity, and possessing perfect fireproof properties;" they, like Mr. Hyatt, take advantage of the property which solid timber possesses of resisting the action of fire for a lengthened period, provided the fire attacks it only on the surface, and does not play round it. They take ordinary wood joists of any uniform depth and any thickness,—2 in. or 3 in. preferred,—place them side by side close together, and bring them laterally into close contact by bolts or spikes, and as a protection to the under-side drive in flat-headed nails and render it with a thick coat of plaster. Solid staircases can also be built up in a similar manner. This form of construction has been subjected to the usual course of successful experiments and appears to possess much merit; it has been used by Mr. Ewan Christian in a public office, and is now being adopted in an extensive range of new warehouses, in course of erection at the East India Docks, under the direction of Mr. Manning. And with the sanction of the Wharfs and Warehouse Committee, the system being adopted in place of that originally required by the committee, viz., wrought-iron girders and concrete or brick arches, supported by cast-iron columns covered with 4 in. of terra-cotta,—timber story-posts being also used,—a saving in cost of construction amounting to about 9,000*l.* having been thus effected.

There are other systems for combinations of timber and terra-cotta,—fire-clay and concrete casings to protect the timber,—such as those of Mr. Thwaite, Mr. Moore, and Mr. Butler, but I leave their consideration to the discussion.

These brief and somewhat discursive notes will suffice to show that within the last few years the true principles which should govern the efforts to produce really fire-resisting construction, have been receiving some appreciation, and that very considerable advance has been made towards the realisation of the possibility of producing a building worthy of being designated as fire-proof. The discussion which will follow will no doubt add much to the information we now possess, and consideration of the subject this evening give a wide extension to the knowledge of those principles by which every attempt in this direction must be guided.

To the discussion which ensued we shall return.

THE INSTITUTE DINNER.

ON Tuesday evening the Royal Institute of British Architects celebrated the conclusion of an arduous session, and the holding of the Fifth General Conference of Architects, by a dinner at the Freemasons' Tavern, Great Queen-street. Mr. Charles Barry presided, and was supported by a large number of fellows, associates, and honorary associates of the Institute, as well as by many gentlemen attending the Conference. Covers were laid for about 130. Amongst other gentlemen, there were present Sir Richard Wallace, bart., M.P.; Sir Rutherford Alcock, K.C.B. (president of the Royal Geographical Society); Mr. E. Armitage, R.A.; Mr. Basil Cooper, B.A.; Mr. J. R. Carroll (Dublin); Mr. John Lanyon; Mr. John Dixon, C.E.; Mr. E. J. Smith (president of the Institution of Surveyors); Mr. F. Ouvry, F.S.A.; Mr. T. Gambier Parry; Mr. Thomas Hawksley, C.E.; Mr. Charles Lucas (Lucas, Brothers); Mr. Barlow (as representing the President of the Institution of Civil Engineers); the Right Hon. Lord Crewe; and other distinguished guests, whose names will be found associated with the various toasts. Grace was said by the Rev. Canon Barry, D.D. The toast of "The Queen, the Patroness of the Institute," having been duly honoured,—

The President, in proposing "The Prince of Wales and the other members of the Royal Family," spoke of the services which H.R.H. was continually rendering for the promotion of the fine arts in this country. Honoured as he (the president) had been by H.R.H.'s desire that British architects should be officially represented at the Paris Exhibition by the president of the Institute, he could not refrain from testifying to the Prince's courtesy and consideration, as well as to his intelligent appreciation of the work of the architect. Out of the two hours and a half H.R.H. had devoted to the examination of the English Fine Art section, he had devoted half an hour to the Architectural Room. He (Mr. Barry) accompanied H.R.H. on that occasion, and could say that hardly a drawing escaped H.R.H.'s notice, many being the subjects of inquiry and intelligent criticism on his part. It could only be hoped that the general public would, in visiting the Royal Academy, spend an equally large proportion of their time in the Architectural Gallery. He (the President) had ventured to remind the Prince that, as Patron of the Institute, he could do them a great service if he could take the chair at that dinner. From H.R.H.'s engagements that was not practicable; but the following letter would dispel any doubt,—did any exist,—as to H.R.H.'s goodwill towards the Institute :—

"Hôtel Bristol, Paris, May 7th, 1878.

Dear Mr. Barry,—I am desired by the Prince of Wales to acknowlege the receipt of your letter of the 4th instant, and to inform you that while fully sympathising with you in the object which you have in view, and which you have set forth so clearly in your communication, he regrets that the state of his engagements will render it impossible for him to accede to your application that he should preside at the next annual dinner of the Royal Institute of British Architects. Should you think proper to renew your request next year, his Royal Highness will be happy to give it every consideration.—Believe me, yours truly,

(Signed) FRANCIS KNOLLYS."

That intimation would, if such a thing were possible, add to the enthusiasm with which the toast he had the high honour to propose would be received. The President concluded with some graceful words regarding H.R.H. the Princess of Wales, and, it is hardly necessary to add, the toast was received with acclamation.

Mr. John Whichcord, V.-P., proposed "The Army, Navy, and Reserve Forces," coupled with the name of Colonel Chesney, R.E., president of the Indian Engineering College, Cooper's Hill.

Colonel Chesney replied.

Mr. G. E. Street, R.A., proposed "The Houses of Parliament," coupled with the names of the Right Hon. Lord Houghton, and the Right Hon. Robert Lowe, M.P. As to the House of Commons, he said that although from the great majority of its members architects could not hope to expect much more than criticism as to the cost of public buildings, yet, when occasion arose, they were capable of appreciating the value of good architecture, whatever its cost, as was evidenced in the case of the new Houses of Parliament. To erect those buildings, they employed the first man of his day, and the result was unique and unequalled throughout Europe.

Lord Houghton, in responding, said he was proud to know that many members of the order to which he accidentally belonged took a deep interest in so noble a pursuit as architecture.

Mr. Lowe, in responding on behalf of "The House of Commons," said Mr. Street's remarks had suggested to him that the House of Commons might be compared to Mrs. Gilpin, "for though on pleasure bent" (*pace* the adjournment over the Derby Day), it "had a frugal mind." Personally, he had always desired to encourage and to promote the interests of the profession of architecture, and with that idea in view during the time that he had the honour of filling the office of Chancellor of the Exchequer, he had several admirable schemes on hand for the architectural embellishment of the metropolis. First, he had a scheme for placing the new Law Courts on the Embankment. Next he had a scheme for placing the Mint on the Embankment; but this was objected to on the ground that the site was too sacred to be polluted by such a building, although he had since discovered that it was now consecrated to the orgies of a public-house. Next, he had a splendid scheme for placing the War Office on the Embankment, but in that he was also overruled. The worst of it all was that there was not a man in England who did not believe that it was the House of Commons that wanted to do all these things, and that it was his "stinginess" which prevented them from being carried out. The right hon. gentleman went on to say that he honoured and respected most sincerely the noble profession so many of whose followers he had the pleasure to see around him, and upon whom, at the present time, a great and important trust devolved. He had lived a great many years in the world, and it had been his fate to witness what he conceived to be a melancholy degeneracy in most things. He had lived in the

times of great poets and writers, who had passed away, leaving no successors behind them. If he were correct (as he feared he was) in thinking that England was losing the crown of literary pre-eminence, of which she was in full enjoyment up to within the last forty or fifty years; and if that loss could not, as he ventured to think, be compensated for by the works of the engineers, however great their utility, and no matter how scientifically devised, it was at least the duty of the architects of the present age to endeavour to leave behind them buildings of such excellence and monumental character as would enable posterity to say that, although the later years of the reign of Queen Victoria were not so brilliant in literary achievements as were those of previous epochs, yet the people who lived then must have been a glorious and a great race to have produced such magnificent works of architecture as were identified with them. The distinguished architects whom he saw present would no doubt do their best to deserve such appreciation of their works by posterity.

The President, in proposing "The City of London and the Corporation," coupled with the name of the Lord Mayor, said it was only meet and proper that they should be favoured with the presence of his lordship, for the head of such a corporation as that of London was, in effect, the Ædile of the great city over which he presided, and it would be desirable if the Lord Mayor became, *ex officio*, one of the new class of members, the Honorary Associates.

The Lord Mayor replied.

Mr. A. J. B. Beresford-Hope, M.P., proposed "Art, Science, and Literature," coupled with the names of Mr. Frederick Leighton, R.A., Mr. F. J. Bramwell, C.E., F.R.S.; and Dr. S. Birch (of the British Museum).

Mr. Leighton, in responding for Art, said he might be allowed to say that so ardent a devotee of architecture as the proposer of the toast, and so enthusiastic a lover of Science for her own sake as Mr. Bramwell, would excuse him for saying that most assuredly it was in architecture that the union of Science and Art was most strikingly exhibited and the full power and resources of their consenting harmony revealed. Mr. Bramwell would agree with him in saying that no architect had ever erected a monumental building which would endure who had not erected it by the light which Science was able to afford him. But it was reserved for Art, in the shape of painting and sculpture, to invest architecture with additional beauties, and to clothe it with further graces. Wherever we turned, — to buildings of whatever age,—this was found to be the case. The Assyrians and Egyptians called in the aid of the painter to chronicle on the walls of their palaces and temples the exploits of their kings and rulers. Later on, when Ictinus had raised upon the southward brow of the Acropolis at Athens a building exhibiting the most subtle beauties that had ever arisen from the hands of man, Phidias crowned it with the images of the majesty of the gods; and when, yet later, in the Middle Ages, architecture sought new forms and a new life in our northern climes, we found the union of art and architecture still indissoluble. In our Gothic cathedrals, the reverent love for nature which characterised all the northern nations led them to represent in sculpture on every capital the flowers of the field, and all manner of beasts and fishes; whilst the mysterious splendours of colour on window and wall deepened the poetic significance of those marvellous structures. He would not stay to inquire how far the union between architecture and the sister arts continued to the present day, as it should continue; but would say that he felt glad that the Institute had, within the past year, testified, in the most marked and signal manner, to its recognition of that principle in admitting to its ranks members of the sister arts. He believed that the step thus taken, based as it was on so sound a principle, could not fail, sooner or later, directly or indirectly, to bear good fruit.

Mr. Bramwell, in a humourous speech, responded for "Science," and

Dr. Birch replied for "Literature."

The President, in proposing the toast of the evening, "Prosperity to the Royal Institute of British Architects, and Success to the Conference," expressed the opinion that it was desirable that such dinners should take place annually, so that the members of the architectural and kindred professions might mutually benefit by social intercourse. Such gatherings would help architects to work together with the view of maintaining and increasing the regard in which they were held by the public,—notwithstanding what had recently been said to the contrary,—by uniformly discharging the many duties which devolved upon them, whether æsthetic, practical, or fiduciary, in a way to command the appreciation of those who were capable of giving it, and respect, at any rate, from those who were not so well able to understand the functions of the architect, and his place in the social economy. These were the primary objects which the Institute had in view, and which, indeed, constituted its *raison d'être* as a corporate body. As to the Conference, the organising committee had devoted much time and thought to the making of all necessary arrangements. It was, therefore, only right to state that the committee was presided over by Professor T. Hayter Lewis, and that its members were Messrs. Charles Fowler, T. Roger Smith, J. Douglass Mathews, T. H. Watson, H. H. Statham, and B. A. Paice (president of the Architectural Association), the zealous and energetic secretaries of the committee being Messrs. Arthur Cates and R. Phené Spiers. The toast divided itself into two parts, and he should put it thus: "Continued and increasing prosperity to the Royal Institute of British Architects," coupled with the name of their country member, Mr. Honeyman, of Glasgow; and "Success to the Conference of British Architects of 1878," coupled with the name of Mr. Phené Spiers. He regretted to say that Professor Lewis and Mr. Cates were unavoidably absent.

Mr. Honeyman and Mr. Spiers responded.

In proposing the next toast, "The Honorary Associates," the President said that in founding this new class of members, the Institute had acted on the belief that there were many noblemen and gentlemen of wealth and position,—whether found in the ranks of the Legislature, or amongst those who were engaged in practising the kindred fine arts or in the pursuit of science, or amongst the public which comprised so many with cultivated minds and natural taste,—who would gladly welcome the opportunity to know architects better by associating with them in the common ties of membership. He was glad to see that the new class of members was represented at that board by such distinguished representatives, the name of one of whom, the Right Hon. Lord Houghton, he begged to couple with the toast. Lord Houghton, as president of the Art Union of London, and in other ways, had done much for the promotion of the fine arts.

Lord Houghton, in responding, expressed his admiration for the art of architecture, with whose professors he felt it a high honour to be associated. He thought that Mr. Lowe was disposed to take too despondent a view as to the position of literature at the present day.

Mr. Cockerell, in felicitous terms, proposed "The Visitors," coupled with the name of M. Charles Lucas, of the Société Centrale des Architectes, Paris.

M. Chas. Lucas, in response, made an effective speech, in the French language. He expressed his high sense of the honour of being called upon to represent the architects of France in that distinguished assembly, and thanked the Institute and the Conference for the courteous reception accorded to him by all, specially naming the President and Mr. F. P. Cockerell, Hon. Sec. for Foreign Correspondence. He said that he had been much struck by the beauties of modern English architecture, whether inspired by Greek, Roman, French, or Early English productions. The presence of the Lord Mayor,—the chief magistrate of the great City of London,—should augur well for the co-operation of art and commerce. M. Lucas, after expressing the hope that he should have the pleasure of seeing many members of the Institute at the International Congress of Architects (to be held in Paris, at the Palais du Trocadéro, from the 29th of July to the 3rd of August next), concluded by expressing his thanks to Messrs. Octavius Hansard and C. J. Phipps for the excellent arrangements they had made in connexion with the dinner.

The concluding toast was "The President," which was proposed by Sir James M'Garel-Hogg, M.P., chairman of the Metropolitan Board.

As will be in some degree apparent from the foregoing reports, the dinner went off with the greatest *éclat*, thanks to the admirable arrangements made by Messrs. Octavius Hansard and C. J. Phipps, in conjunction with the secretary of the Institute, Mr. William H. White.

ON ARTISTIC IMPROVEMENT OF THE POORER LOCALITIES OF LARGE TOWNS.

WITH SPECIAL REFERENCE TO THE EAST OF LONDON.*

IT is impossible, I hope, for any one in the habit of running in and out of London on the various suburban railways, which have lately grown into such an enormous locomotive system, not to be seriously impressed, now and then, with the nature of the scenery over which he is conveyed on the top of the railway company's viaducts. Regarded in this light, the impartial march of the iron road over the tops of whole square miles of house-roofs, besides its positive advantage in getting us to our destination by the shortest cut, has the moral advantage of letting us see something instructive and sobering to the mind while *en route*—something which is not otherwise seen except by those who go forth especially to look for it. Driving through or or out of East and South London by the ordinary routes, or taking the tramway communications now laid down in the principal lines of road, a stranger to those parts may very easily be deceived as to the real character of the district he is passing through. He goes along the centre of a wide road, flanked by respectable-looking shops and houses, and here and there a small tree or two, a sparkle of bright fresh green amid the perspective of dull brick; and even this perspective of dwellings and warehouses, seen for a long distance along a stretch of road, is not without its picturesque properties; indeed, some of my East-end friends declare that Commercial-road is more picturesque than any street view west of the Bank. But, however that may be, the railway viaducts have taken most of us behind the scenes. From the East London terminal stations—from Broad-street, Fenchurch-street, and Bishopsgate, we pass over and look down into heaps upon heaps, one may say, of dirty brickwork, intersected by smaller courts and alleys, or bordered by infinitesimal back yards that seem the receptacles for all the unsightly lumber and refuse which can be crowded into them. To appreciate fully the excessive ugliness of the districts which lie between the main lines of road, we must visit and inspect them more in detail; but the railways serve to give a rapid and comprehensive bird's-eye view, and a very depressing spectacle it is.

Now, as to the sanitary deficiencies of the poorer and more crowded parts of our large towns, there has undoubtedly been, though late in the day, a great awakening in the public mind recently; and though all progress in regard to a matter so long neglected, and which leaves so vast an accumulation of work to be faced, must seem comparatively slow, still a great deal is being done; important legislative machinery has been framed for facilitating schemes of sanitary reform; sanitation, as it is sometimes called, has become an almost popular subject, and large blocks of "model dwellings," providing for the poor the opportunity of living in cleanliness and decency, are already in existence in many parts of London, and are likely to be followed by others. And perhaps nowhere has more attention been given to sanitary questions than at the various congresses and other meetings of this Association for some time back. But little or nothing has been said as to the possibility of rendering the poorer quarters of great towns not merely more healthy, but more beautiful (or, should we rather say, less ugly) than they usually are. Yet the necessity for something of interest at least, something of the picturesque in character and aspect, is even greater in the poorer than in the richer parts of a town. The wealthier inhabitants not only have many more sources of interest and enlivenment within their reach, but they have also the power of change of scene by taking holidays out of town, which their poorer brethren very seldom have. The more need then that some consideration should be given to the possibility of securing, for those who must pass most of their lives in streets and courts, something of variety, interest, and beauty in the aspect of their surroundings. The subject, of course, has no special reference to London more than to other large towns, except that the magnitude of the area built over is so immense, and the difficulty of escape from it for change of scene proportionally greater. But in offering a few suggestions on the subject, I named the East End of London, partly because it was owing to recent

* By Mr. H. Heathcote Statham, F.R.I.B.A. Read at a meeting of the Social Science Association, May 27th.

pretty frequent visits to East London that my thoughts were drawn to the subject, partly because the subject thus, in Bacon's phrase, "comes home to our business and bosoms," and is likely to do so still more; for though the East End is still a *terra incognita* to most of the dwellers in the West, there are indications that this will not always be so, and there is already a small band of those who are desirous to break down the middle wall of partition which separates the two Londons, so that perhaps ere long the architectural amelioration of the East End may become an object of even direct and immediate interest, on other than merely philanthropic grounds, to the dwellers in the West.

It must be admitted that the area to be dealt with is so great, and the accumulated difficulties of the problem so formidable as to give some excuse for the suggestion made to me the other day, that the only thorough remedy was to sweep away the greater part of East London bodily, inhabitants and all, and begin afresh; but this plan, though there is much to be said for it in theory, would run counter to many still surviving prejudices in regard to life and property. All we can aim at just now is to consider in what particular points it might be possible to bring about improvement in the aspect of things, positively and negatively; to suggest ideas, to get them talked about, and to trust that, if there is anything feasible in them, they will, by degrees, bear fruit in action.

Now, if we come to consider wherein would lie the difference between ugliness and attractiveness in a locality which has necessarily to be nearly covered with buildings, I think we should find it depend mainly on three conditions,—the materials used, the design or the method of employing them, and the spacing and arrangement of the open areas in relation to the portions built over; or, in other words, the general laying out of the grounds so as to give variety and effect, and produce points of interest and climax. There is another element in the contour of the ground; for it is scarcely possible to make a town otherwise than picturesque which is built on a site with much variety of levels; but this is a matter we have to take as we find it; and, as to materials, we are, of course, limited, in the poorer quarters of a town, by considerations of cost. Unless we wish to æsthetically pauperise, so to speak, a whole neighbourhood by presenting them with beautiful materials, we must restrict the buildings to such materials as are commensurate in cost with the return that is to be regarded as possible; and at present, as we all know too well, brick is the staple commodity, and has, for the most part, held its place so far in spite of much that has been said against it. Now, there is no doubt that good brick is a fine building material in itself; but it has a great facility in holding soot and dirt, and, from the nature of its surface, it is almost impossible to give it any efficient cleansing; hence arises the peculiarly grim and grimy effect which the old brick streets of East London have, and which, in itself, would go far to render them dreary in appearance even if there were more attempt at picturesque manner or design in the buildings. Yet it is difficult to say what we can propose, economically, to substitute for brick, which will be any material improvement. The suggestion has not unfrequently been made, that for town houses where there is much smoke a material capable of being readily washed should be used. The late Sir G. Scott was much interested in this idea, and spoke strongly in favour of it; but then he was referring to buildings where a certain amount of expenditure on appearance was contemplated. But to recommend glazed brick (which is about the only washable building material we have at present) as a material for East-end building, as in some well-intended suggestions by a lady which I read the other day, is unpractical, as it is nearly three times the expense of ordinary brick, and, therefore, entirely out of the question in cases where the problem is how to secure a remunerative return even for the cheapest properly-constructed building. The building of tenements in lofty blocks of many stories, so as to reduce to its minimum the first cost of land and foundations, and get the greatest amount of rental from a given area of land, of course, offers more margin for a little expenditure on appearances. A word about that just now. But for dwelling-houses of ordinary size, even if we allow two stories of tenements one over the other, it seems difficult to know where to find any spare funds for decorative treatment; the simple brick wall, with square holes in it, provided the materials and workmanship are honest and good of their kind (which is a *sine quâ non*), runs away with all the margin. There is, however, one material for building about which much has been said by architects of late years,—concrete walling,—concerning the advantages and disadvantages of which divers rather contradictory opinions have been expressed; but which it would certainly seem worth while to make more trial of in its application to buildings where economy is an object. The relative cost of concrete walls, as compared with brick, varies with the locality and the immediate facilities for obtaining the raw materials. In some parts of the country, concrete building has been done at less than half the cost of brick. Here, in London, we may say that concrete dwellings, especially if a good many were carried out by the same contractor, who would use the same apparatus over and over again, could be executed at about two-thirds the cost of equally good buildings of brick. "But what about appearance?" it will be asked by those who know what concrete walls ordinarily look like. Well, there would certainly be no gain in that way if we merely substituted concrete for brick; but then we must regard the one-third cost of the brick building which is gained as so much let loose to spend upon making the buildings look characteristic and interesting. Let us see then what can be done with our concrete building. In the first place, concrete walls are usually built in heights of about 2 ft. at a time, and when what has been put in has sufficiently set, the apparatus is raised for another layer of 2 ft. There is here an indication, in the very method of working the material, for breaking up the dead flat surface of the wall by strongly marking the joints of the various layers, like what in masonry is called "rusticated" work, by using for one course moulding boards with a simple pattern, of which the concrete, before hardening, would take the impression, so as to produce a decorative band; and it appears to me that it might be quite possible to vary the tone or colour of the alternate bands slightly by mixing a little colouring matter in the concrete, or varying the materials of which it is composed, so as to produce a simple kind of polychromy. But this emphasising of the horizontal layers of the wall could only be regarded as a suitable treatment for the lower story, to which it would impart an appearance of strength, by marking strongly the horizontal lines of the structure. To continue such a treatment up to the roof, though it would give us a brighter tone than brickwork, would only produce a kind of "streaky-bacon" architecture. But in the upper portion we can produce a great deal of interesting and even brilliant colour effect by building in, at appropriate points, a row or two of coloured tiles, which can be "washable," so as to have a chance of preserving their brightness; and we might press into the service even humbler materials than these. A very jewelled effect might be produced by a judicious use of green-bottle-ends built into our wall, as may be seen done in the gables of Northamptonshire cottages; and coloured and glazed pottery, in the shape of circular plates, set in cement in the wall surface, would form charming centres of coloured decoration of an almost indestructible character. Then the use of concrete in itself almost naturally suggests the use of plaster as a finishing material, and a material easily capable of ornamental treatment in a very inexpensive manner by impression on the surface when wet, by which means, even if nothing more ambitious in design is attempted, what would otherwise be a cold, dead surface may be diversified by a diaper giving it tone and shading.

But we can only apply plaster advantageously in this way if we get the ground for it with something of a panel character, so as to have a definite bounding edge, as builders say, to "stop" the plaster. And this suggests the employment of an old method of construction in this country, that of timber-framing, only under much more suitable circumstances. A great many of the old half-timbered houses of England are composed of timber-framing filled in with brickwork, a construction of which it is difficult to find the *raison d'être*, since fitting the brickwork to the spaces is more troublesome and more expensive than merely building up with brick in the ordinary way. But concrete is a more suitable material for filling in spaces of irregular shape; and an oak timber framing, filled in with concrete and plastered between, would probably prove as durable a wall as one could wish for, and give relief and picturesque effect at the same time. Timber is forbidden by the Metropolitan Building Act as part of the exterior walls of a house, no doubt from the idea of danger from fire. But this is an unnecessary fear if we are dealing with oak, which is found in practice to be one of the most fire-resisting of materials, and would be more especially so when in close combination with concrete and plaster, which are among the few practically incombustible building materials in use. A construction of oak framing and concrete would hardly be a saving over brick over a whole building, but the plain lower story of concrete would leave us margin for the oak above, which, unfortunately, is in the present day much more expensive than it need have been had our large natural stores of this timber been husbanded and kept up, as they well might have been, instead of being permitted to dwindle away through lack of attention and forethought.

The fact is that, as a practical question, there would not be half the objection on the score of safety from fire to such a construction, which there is to the wooden erections generally put up over the front entrance of shops, and to the support of the whole superstructure (where there is the ordinary show shop-window) on a single iron column. But this matter of the shop-fronts belongs to the æsthetic as well as to the practical part of the subject. When an immense number of buildings are massed together nothing tends more to give them a look of meanness, insecurity, and probable decay, than a palpable want of solidity in construction, more especially when involving an obvious sham. And this is the case with the shop front, in most quarters of London, but the result is more especially unhappy in the East-end streets. We have miles upon miles of these painted band-box shams put up over and round the shop entrances, which represent no inconsiderable sum of money, which are always getting to look rickety and out of repair, and then furnish excuse for the indulgence of a vulgar taste for gaudy and barbarous combinations of colour, in painting them up to look smart again. This flimsiness and show are unfortunately only too characteristic of the game of brag which modern tradesmen will probably say that they *must* play whether they like it or not; architecture in these matters is the expression of habits of life, and if trade were carried on upon a basis of always supplying the best thing instead of always professing to do so, it would not be necessary for each shop-owner to try to out-do his neighbour in the show that he can make in his front, and to put up a flimsy mock construction in front of the real building. It will be a great step towards making street architecture in towns more dignified if one could inspire tradesmen with a preference for honest though plain building in their shop-fronts, instead of these pieces of joiner's scenery; for when you get a mass of buildings together, anything like ricketiness and want of stability tells more against their effect, does more to produce a sensation of squalor, than almost any other characteristic.

Returning for a moment to our decorative suggestions, there is a method of external decoration which is peculiarly suited for combination with concrete, since it again employs the cognate material, plaster: I mean the process called *sgraffito*. This, it is hardly necessary to explain, is a method of producing designs in black and white, by covering over a layer of black with a very thin coat of white plaster, and then producing a design in outline or silhouette by scratching away the thin white coat, so as to leave a design either in black on (apparently) white ground, or *vice versâ*. Shaded drawings in relief can also be made by hatching with thin lines, like an engraving on a large scale; though this style of treatment, more interesting perhaps in itself, is not so well suited for decorative effect. *Sgraffito*, however, can hardly be added as a decorative feature to working-class tenements, with due regard to economy. But the ground for it, the black and white plaster panels, can, in a cement building, be prepared and made ready for the artist without exceeding the limit of economic outlay. The drawing and executing of some such designs might in that case form a very agreeable and instructive occupation for some of those who I hope are now learning drawing in the Board Schools, and who will be able to help to bring sweetness and light into their future homes thereby. Nor would it be

too much to expect that dwellers in other localities would be willing to turn some of their talents and opportunities to account in giving some of their attention to the decoration of less favoured districts. That is, I think, a legitimate kind of charity: it is not the same as giving away land at a reduced rate because it is for working-men's dwellings, from mistaken feelings of philanthropy: in giving of your artistic acquirements to promote the enjoyment of your fellow-man who is in want of something to interest him, you give what he specially seeks, "not yours, but you." So also it may be suggested that among the many who are now finding an intellectual pastime in modelling, may be those who would willingly give some of this joyful labour of their hands to decorate the homes of those whose labour is often otherwise than joyful. In the case, however, of the very large blocks of many-storied buildings, such as are now being erected, or have been recently erected, I conceive that it ought to be possible to contrive a margin in the expenditure for providing for a higher class of decoration than has usually been attempted in such buildings.

And this brings us to the question, are these great blocks of model dwellings, which we now find in so many places about London, and for which several fresh sites are already appropriated, altogether admirable? When we walk through some of the poorest streets of Bethnal-green, and contrast the small, grimed, and tumble-down looking houses which line them, with the solid and substantial blocks of buildings erected by Sir S. Waterlow's Company in the neighbourhood, and reflect further that these latter are scientifically planned and provided in regard to sanitary requirements, and that the others certainly are not, we, of course, feel that a great step has been made. But I think we can hardly as yet accept this system of providing dwellings for the poorer class in towns by means of great mill-like stacks of buildings as the model method of procedure for the future. For one thing, I cannot but think, whatever may be said to the contrary, that the sentiment of "home" must be a good deal interfered with by this plan of making a great hive of human beings grouped together in one great building; or if it be said that many of those thus housed never had any sentiment about home, the growth of it is, at least, prevented. At the same time, this objection to the model houses scheme is made far stronger than it need be by the manner in which they are built. While this subject was in my mind, I have been looking over several of these big erections in different parts of London, and everywhere experienced the same kind of feeling of oppression, arising from the unnecessarily grim, square-set, and what I can only call workhouse, air which is imparted to them. They have a dreary, official aspect, which makes one feel as if one must have done something wrong before one went to live in them. About the management of these buildings I do not know much; but I heard or read the other day of some people objecting to live in one of them because "they could not abide to be drilled in that way." There might or might not have been reason in the objection,—some people are the better for being drilled,—but what I here complain of is that the buildings look like it, and that it is much better they should not do so. The practice of making one great symmetrical block, with the same projections, windows, &c., repeated in dreary succession from end to end, at once conveys the idea that the life inside them is to be conducted on the same kind of wholesale system. Now, it is utterly unnecessary to give to such buildings this forbidding and official appearance. There is not the slightest reason why the whole block of buildings should be a system of mechanical repetition of the same parts, and then another block put alongside of it cast in the same mould, only turned the other side about, as if a suitable plan of one dwelling having been made, nothing remained but to stick as many of them together as possible, or as if the thing were made in lengths of a mile at a time, and pieces of suitable size cut off and put down in different parts of the town. There is no reason for this, except to save some one the trouble of thinking about it a little. It is not a question of cost of labour and materials. It would cost nothing but a little thought, and a little of that kind of perception which we commonly call "taste," to give a picturesque variety to these masses of building, so that they might be something like an addition to the architectural interest of the locality, and that the inhabitant might attach a distinct association, at least, to his own part of the building and his own entrance, and not merely know it as the fifth door in the row. If this kind of variety were given to the buildings, there would be a certain interest in their appearance, even apart from any decorative treatment; and, indeed, decorative treatment had much better be omitted entirely unless it is to be something very different from what has mostly been attempted hitherto. It is vexatious to see such buildings rendered still less homelike by the addition of bad and tawdry ornamentation, in the shape of pilasters and window-dressings cast in artificial stone, in a style which, at the best, could only be called "handsome"; but which, as carried out in some of the model dwellings, may rather be termed "'andsome" without the aspirate. If we are to give the poorer classes what is called "Classic" detail and ornament, let it, at least, be good Classic, from which they may learn something in regard to refinement of form and style in design. But I should be disposed to say, if you endeavour to decorate the poorer quarters of towns, do not be too artificial; if possible, let your decoration be such as will afford suggestions or reminiscences of that natural beauty which the poorer dwellers in towns so seldom have a chance of seeing in its reality,—something which will add life and piquancy to the street in which it is carved or painted. It is wonderful how much a bit of ornament, which seems to recall the life and growth of nature, will interest those who have to get nearly all their idea of nature by hearsay and recollection. A small tradesman in the East End showed, with interest, to the clergyman of his parish, his room covered with one of Morris's paper designs: "Seems as if it was all a-growing," was his comment; and this is what interests people under such circumstances,—something which seems to have life and growth, not mere conventional forms of architectural ornament, treated without the refinement or finish which is necessary to give them any value. Rather than this, it is far better to trust to mere outline and grouping and tone of the various materials for effect, and let so-called ornament alone altogether.

It must be admitted that the existing Metropolitan Building Act, with its preventive clauses in regard to forbidden materials and to the deadly sin of letting any portion of a building project or overhang, is a great impediment to picturesque architectural character, and in some ways quite unnecessarily so. In the City thoroughfares east of the Bank are not a few good substantial-looking old houses which overhang in their upper stories, giving more room inside, and very much improving the general effect by giving shadow and breaking up the straight line of street, and doing no harm to any one that I can see. The mischief of such incidents in building is not in themselves, but in their being attempted with bad and faulty construction. Here, again, we have the connexion between architecture and morality. If people could be trusted to build carefully and honestly, there would be little need of a Building Act, except to settle or prevent disputes as to party walls; but as this is not the case, all the excrescences of building have to be pared off by wholesale regulations which destroy the righteous with the wicked, and operate so as to lead to the conclusion that whatever is picturesque and characteristic is wrong, and that sanitary building is especially and indissolubly linked with ugliness. It is surely time to try if it is not possible to combine the picturesque with the healthful in building.

If the principle of model dwellings in great blocks is to be continued, one thing is certain,—that a much wider road-spacing ought to be insisted upon between buildings of such a height than generally exists at present. Even if we regard these immense blocks as only occasional resources for relieving pressure on an over-populated district, they ought to be regarded as setting free a certain portion of ground as open space. If we could imagine all the parts of London where small houses are wanted rebuilt in houses of even two stories of tenements one over the other, we at once double the house-room over a given area, and ought to have spare room to widen the narrow alleys and enlarge the main streets and open places; and it would be worth while to try the experiment of building street houses of this class so that another story could be added to them with no practical difficulty and little disturbance of the inmates; so that when a district became overcrowded, and the demand for house-room in a certain quarter exceeded the supply, it would be merely necessary to add another story of dwellings. The facility for doing this would be much increased by the adoption in such cases of flat roofs, which would form the floor of the upper story when or if it was added, and in the meantime would afford in fine weather a recreation place for the dwellers below. Modern resources in the way of concrete and iron and cement leave no difficulty in making flat roofs (of course with a sufficient fall of the surface), and I have often thought their introduction in towns would prove in many ways very useful and advantageous.

The question of general arrangement of roads and open spaces is one which ought to be directly affected by the model dwelling movement,—by the principle of building houses vertically over each other, since this system necessitates, and ought, if properly managed to leave room for, much larger and wider streets than at present exist in East London, with the exception of the principal thoroughfares. These, such as Whitechapel High-street and Commercial-road, are large wide avenues; but there is much want of a breaking up of the intermediate crowded districts by wider streets, such as will afford more light and better circulation of air. And it is very desirable that such openings, in the parts nearer to the river, should be made at right angles to the river, so as to give the interest of distant glimpses of the water and the shipping, and act as ventilating conduits to lead the comparatively fresh air from the river up further into the town. The natural tendency in the growth of a town on the banks of a river is for the principal streets to run parallel to the river; and it is therefore desirable that some special thought should be bestowed on securing wide and open cross-communications, with the objects just mentioned. Another point to be arrived at in arranging new lines of street is to give prominence to any building that has any architectural beauty or interest, so as to make it as effective as possible in giving picturesque character to the neighbourhood. Some of the older East London churches have much that is very fine about them, which is nearly lost now. The visitor who goes to St. George's in the East for the first time meets with what may be called almost a *coup de théâtre* when, walking down the small and uninviting street from which the churchyard opens, he suddenly finds himself before a noble ornamental iron gateway, through which he sees the lofty façade of a large church thoroughly dignified and grandiose in appearance in spite of some odd and corrupt detail; and his next thought is (if he has any eye for architectural effect) what a pity that this fine front and gateway, with its overhanging trees, should not be visible down a vista of half a mile of road, instead of being only come upon accidentally in a corner. Unfortunately, the tendency seems to be to neglect and even spoil such chances where they exist. Spitalfields church, which also has a fine and effective portico that might be made the centre of some better surroundings, possesses likewise a very spacious churchyard planted with trees, which formerly extended right through from Commercial-street to the parallel thoroughfare of Brick-lane, so that both streets had the benefit of the trees. Not only is this space shut away from the public and unused, but lately the new schools have been built across one end of the space, cutting off the vista and depriving Brick-lane of its sight of the foliage.* In the building of new churches in East London a great mistake seems to have been made for some time back in the endeavour to build a number of small churches as economically as possible (churches at 4,000*l.* a piece or so), whereas it would be far better to concentrate the funds on a few large ones which would give the same accommodation and add something like architectural grandeur to the sites on which they were placed. How effective a large church may be in such a neighbourhood is seen in the case

* In reference to another open space, the locality known as "Mile-end waste," a clergyman in East London writes as follows:—"At the sides of the great artery of the East End are two banks sloping gently to the pavement. The banks are now mud-heaps, on which brawlers, mountebanks, and preachers collect. There is no authority to make such people move on, or to prevent the place being disfigured by rubbish and advertisements, in consequence of a difference between the vestry and the lord of the manor. The place, now so ugly, might be laid out with trees, seats, and fountains. So laid out, it would preach daily to thousands a lesson of order, if not of beauty. Proposals have been made to the vestry to assist in laying the ground out, if some guarantee could be given for its being kept up." Here is another opportunity for improvement almost, as one may say, going begging.

of the new church in Whitechapel High-street, the tower of which also, when completed, will be an effective object, seen along a great part of Fenchurch-street and Aldgate, the tower being nearly central with the line of the latter street. One other suggestion may be made, which is not without its practical difficulties, but is worth considering; the possibility, namely, of introducing a little ornamental water in the form of basins or canals (in conjunction with fountains) into open spaces. Care must be taken to get sufficient flow through it to prevent stagnation, and it is no doubt an experiment to be tried with some caution, but water is so invaluable in brightening up a scene by its reflected light and colour that it seems worth while to try it.

After noticing some special things which give chances of picturesque effect, we may, on the other hand, notice some which are terrible eyesores, and which might be less so. In the first place, the large warehouses, which are necessarily erected in many parts of East London, and which form immense blocks of brickwork overlooking the street and shutting out the sunlight. In quarters entirely given up to warehouses this is of less consequence, though even there it might surely be an object to render such buildings grand and striking in effect, than which it might almost be said nothing is easier; the elements of architectural effect are all there and have only to be rightly used. But when such buildings are contiguous to inhabited quarters, it is rs lly a kind of moral duty in the owner who erects them, who, in all probability, is a wealthy man, living out in a pleasant country-house himself, to render them something which will add life and interest to the locality in which they are built, and not be only a new and gigantic shadow over it. In some quarters, notably in some parts of Wapping, this attempt has been made in a very laudable way; in other places, no thought of the kind has been given. The railway companies have an enormous power in their hands for making a place ugly or the reverse, and some of their large terminal stations are certainly on the whole improvements of the neighbourhood in which they are built, and would be more so if it were not for their hideously ugly expanse of iron roof. It would be possible, I think, to make a railway station almost as fine an object as a cathedral, but the attempt has hardly ever been made in the right spirit yet. The sin of the railway companies in regard to the East End consists rather in the horrible bridges which they put up over the streets, masses of iron girders at the sides, and in some cases the under side covered with a kind of ceiling formed of waste pieces of rusty corrugated iron, concealing the lower edges of the girders, and put together regardless of finish. This kind of thing is only done at the East End, where the theory seems to be that appearances are of no consequence; and unless the West End takes up such matters, those whom they immediately affect have little chance of making their voice heard. There is another source of architectural beauty and interest in towns,—the gasometer. A great outcry against gas has been made by æsthetic people lately. In the little light blue books which are being published by Messrs. Macmillan, to tell us how to put art into our houses, gas is never mentioned without denunciations in the most withering terms, chiefly because it is supposed to be unwholesome and to spoil things. This, however, is because people have persisted in burning gas without making the slightest provision for carrying off the products of production and the heated air from their rooms,—a mere want of common sense; and when people do what is contrary to common sense they generally suffer for it. A much more serious charge against gas is that it presupposes gasometers; and what to do in mitigation of the ugliness of the gasometer it is, indeed, difficult to say. We might illuminate them with pious texts or moral maxims; indeed, the whole Sermon on the Mount could be got on to one of them large enough to be read for half a mile round. A Utopian idea of architecturally getting rid of them did occur to me the other day. There is usually a certain amount of free ground round a gasometer. It is not necessary to have the workshops close up to it. Might not a gas company and a model-dwelling company purchase ground and go in for the thing together, the model dwellings being built in a circle round the gasometer, thereby affording opportunity for a *coup d'œil* almost equal to that of the Colosseum, shutting out from view a hideous object, and all in the way of fulfilling practical ends? It is possible, however, that the gasometers will remove themselves, in the ordinary course of events, before many years are run out. There are indications that electric light is not unlikely to take the place of gas.

As to the agency by which any improvements such as those above suggested (supposing them to be desirable) can be carried out, that, indeed, is a very large and very difficult part of the subject. We might propose and carry a resolution that it is desirable that East London be rebuilt; but who is to do it? The question is partly mixed up with one upon which there is some, though I think not much, difference of opinion; namely, whether efforts to provide improved and pleasanter dwellings for the poorer classes should necessarily be planned on the basis of a remunerative investment. No sane person, one may suppose, will have any doubt that as a rule they should be so, as the only sound principle to go upon; there is only this to be suggested, on the other hand, whether through long neglect of the problem the evils to be cured have not got to such a crisis that only a great and exceptional effort can make any impression upon them or give any new start to improvement; and whether it is not even to the interest of one-half the community, putting aside percentages for the moment, to expend some of its wealth in enabling the other half to make a beginning of living in more cheerfulness, comfort, and health, which will be returned in the general advantage accruing to the whole community from the better health and happiness of its most hard-working portion, in the next generation, if not in this; and whether, under the circumstance, too unyielding an adherence to the economic system is not likely to amount to a putting in practice of the sixth commandment in the form in which it is put in Clough's bitterly sarcastic verses called "The Modern Decalogue":—

> "Thou shalt not kill—but need'st not strive
> Officiously to keep alive."

But that kind of striving is just what is required,—not merely to provide ordinary sanitary conditions, but to make life for the poorer classes in towns something pleasanter than it is,—something more than mere existence. Good drainage is a great thing; but man cannot live by drainage alone. Of course, those to whom we shou'd have the most direct right to look for assistance in improvements are the owners of East-end property. About the relations of owners and property in that part of London, I do not know much; but I believe it is for the most part in small properties in a great many hands, which is, of course, an additional difficulty in the way of enlisting landlords in the good cause, as the presumption is that, under these conditions, few of them are likely to have much margin in the way of available capital to lay out; and, indeed, I know that not unfrequently there is great difficulty experienced in compelling landlords of East London property even to do what is their legal duty in keeping houses in proper repair. But it is to be hoped that no discussion of such a subject, even if it can lead to no immediate practical result, is entirely thrown away if it sets any one thinking about it who has not before done so.

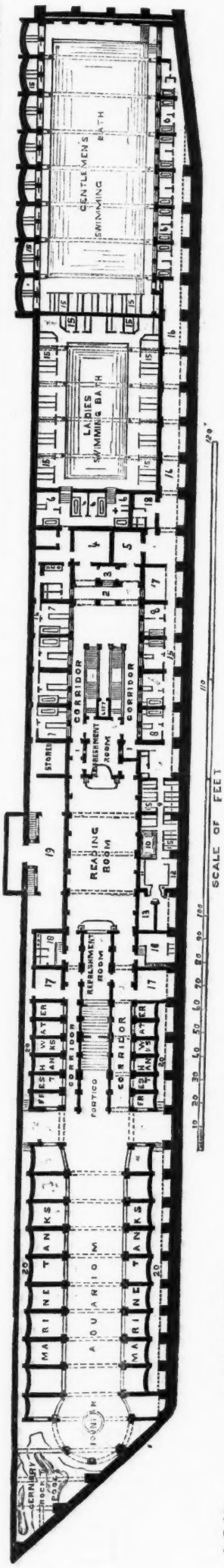
PROPOSED HASTINGS AND ST. LEONARD'S PUBLIC BATHS AND AQUARIUM.

MR. THOS. BRASSEY, M.P., has opened a portion of the building contemplated by the projectors of this establishment,—namely, the Baths. We give some illustrations, including a plan and description of the whole scheme.

The baths occupy the western portion of the site, and are to be approached by a double flight of steps leading to an open portico, on one side of which will be placed the entrance to the gentlemen's baths; that to the ladies' being on the other. Between the two entrances will be a check-taker's office.

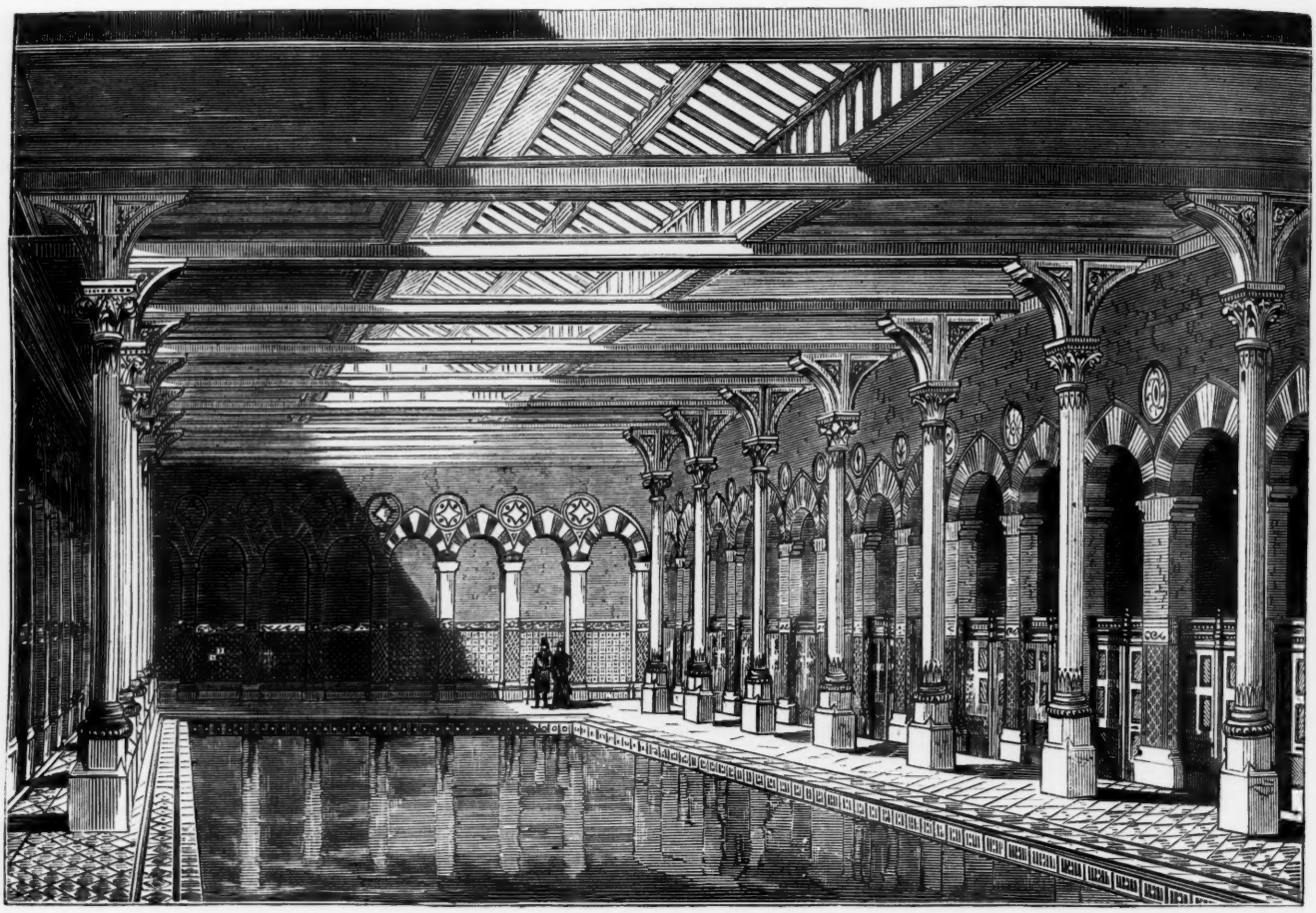
On either side of the large open area will be placed the first-class private baths for the two sexes, four in number, each consisting of a bath-room, with dressing-room and convenience attached. These will include every description of bath,—hot and cold, fresh and salt water, slipper, shower, douche, medicated, vapour, hot air, and various hydropathic packs and foments.

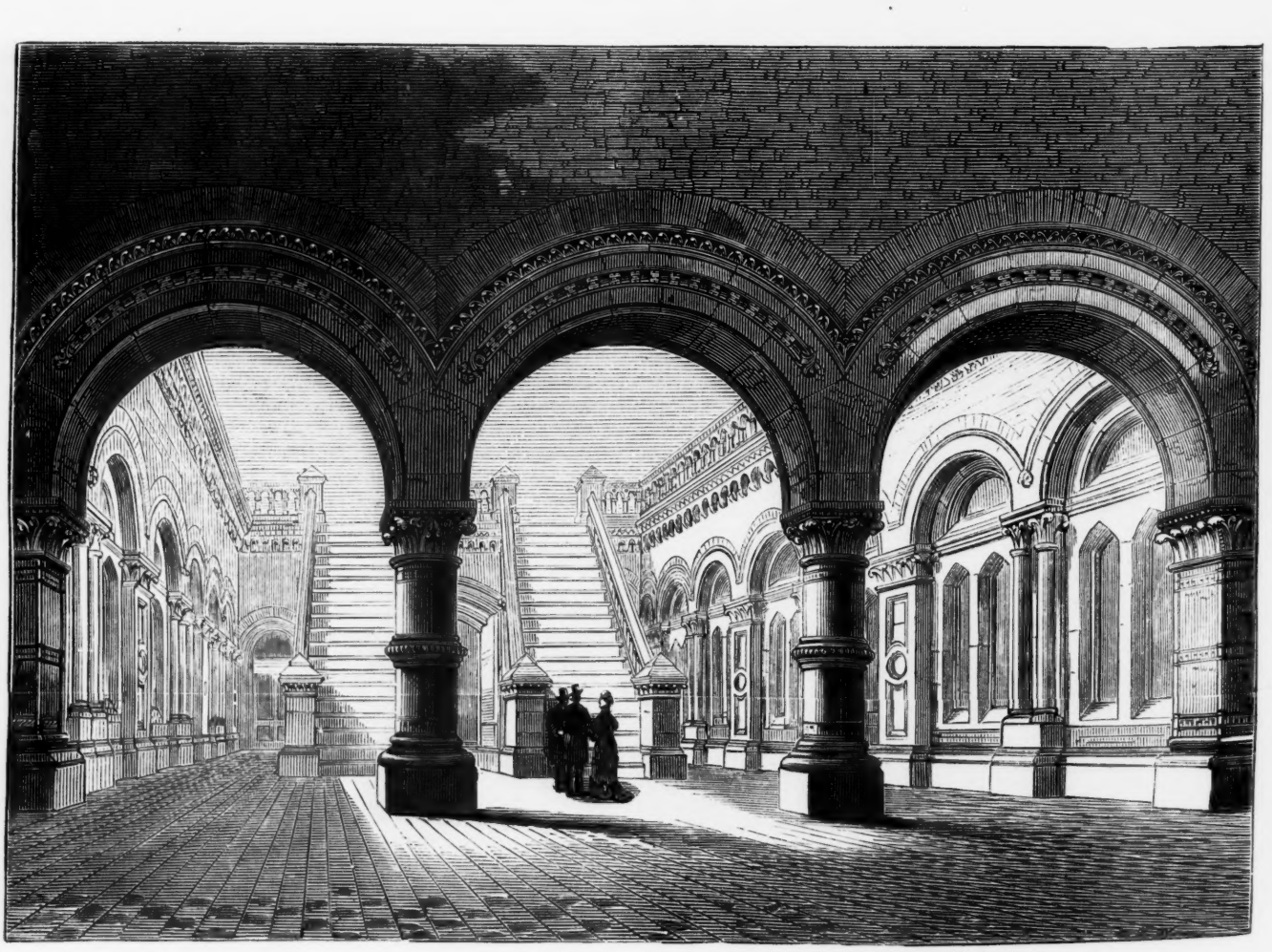
Besides these, six more private baths are provided on the gentlemen's side, and three on the ladies', each having access to the swimming-baths. These will be supplied with hot and cold, fresh and salt, water only.



1. Lobby.
2. Porch.
3. Ticket-office.
4. Ladies' Waiting-room.
5. Gentlemen's Waiting-room.
6. Private Baths.
7. Ladies' Private Baths.
8. Gentlemen's Private Baths.
9. Turkish Bath.
10. Plunge.
11. For Shampooing.
12. Lounge.
13. Hot-room.
14. Hotter.
15. Dressing-boxes.
16. Corridors.
17. Attendants.
18. Lavatories.
19. Washing and Drying Room, Engine, Boiler, and Coal-store under.
20. Private Passages to Tanks.

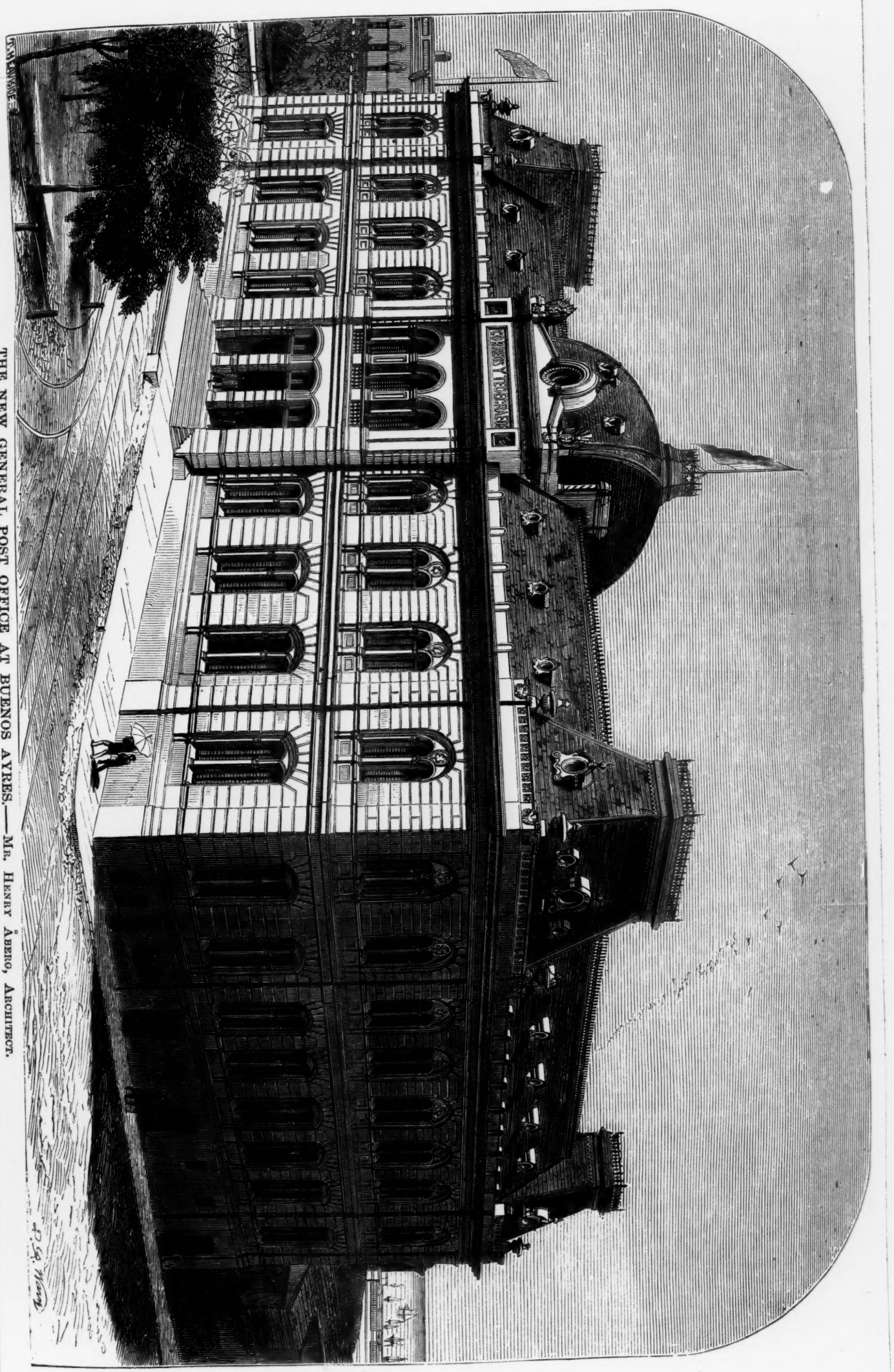
PUBLIC BATHS AND AQUARIUM FOR HASTINGS AND ST. LEONARD'S.—*Plan.*





PROPOSED HASTINGS AND ST. LEONARD'S PUBLIC BATHS AND AQUARIUM.

MESSRS. CROSS, JEFFERY, SKILLER, & WELLS, ARCHITECTS.



THE NEW GENERAL POST OFFICE AT BUENOS AYRES.—MR. HENRY ÅBERG, ARCHITECT.

The gentlemen's swimming-bath is approached by a spacious corridor, 8 ft. wide, and has an area of water 100 ft. by 40 ft., with dressing-boxes on two sides.

The ladies' swimming-bath will be fitted up similarly to the one just described. The water will be kept in motion by jets round the edge, and will be made tepid by means of steam-pipes. The depth will vary from 3 ft. 6 in. to 6 ft. 6 in.

Lavatories and conveniences, attendants' rooms, and also a separate waiting-room for ladies and gentlemen, are provided.

To make the bathing establishment complete, a small Turkish bath will be attached. The whole of the sea-water will be filtered, that for the private baths being pumped up into cisterns, and that for the swimming-baths being let in and out according to the tide.

The Aquarium, which may or may not be carried out, was placed in the original scheme at the eastern end of the site. It contains two rows of marine tanks, eight in number on either side of a promenade 20 ft. wide, terminating in a circular end, with a fountain in the centre. Beyond this it was proposed to construct a grotto, or cavern, space for table aquaria, and twelve fresh-water tanks in two corridors, with cloak-rooms, office for curator, and room for aquarium manager.

In the centre, between the baths and aquarium, and accessible from both, it was proposed to place a large room 65 ft. by 30 ft., with refreshment-bars, &c., which could be fitted up as a reading-room, lounge, billiard, or concert room, as thought desirable.

The architects engaged are Messrs. Cross, Jeffery, Skiller, and Wells.

THE NEW GENERAL POST OFFICE AT BUENOS AYRES.

THE new Post-office is situate in the Plaza, 25, de Mayo, on the site of the old fort, the headquarters of the Spanish Viceroys in former times, before the inhabitants had thrown off the yoke of the old country.

Alongside is the old and unsightly National Government House, erected long before the people or their rulers took any interest in the appearance, conveniences, or comfort of their structures. For some years past a notable change in this respect has been gradually developing itself, and many imposing private and public buildings are now to be seen in and around the city. And, although the taste displayed is often of a very questionable character, and indicates too frequently a straining after effect, at variance with all recognised architectural principles, a more healthy tone seems to be setting in at last, and the grotesque vagaries of the Italian bricklayers, hitherto prevailing, are now decidedly on the wane.

The frontage of the building forming the subject of our illustration comprises 50 mètres, with a depth of 35 mètres. The ground-floor contains all the necessary offices for the receipt, delivery, and transmission of letters, in addition to a complete suite of rooms for the telegraph department.

On the upper floor are found the private apartments of the Director-General, with spacious and convenient offices for the very large administrative staff the exigencies of the service now demands, owing to the Republic having entered into the Berne Postal League.

The decoration of the interior is handsome and effective; notably so in the grand entrance and staircase hall, which is embellished with a bold allegorical design in sgrafito,—the first example in the country of this style of decoration.

The cost of the entire building, including all the necessary furniture, amounts to four million dollars paper currency, or about 28,000*l.*, which contrasts well with the extravagant sums previously lavished on some of the other public buildings.

The architect of the work throughout is Mr. Henry Åberg, a diploma'd ex-pupil of the Stockholm School of Fine Arts, whose designs for a continuation of the same building to replace the present unsuitable Government House was a feature amongst the Argentine exhibits in the Philadelphia Exhibition.

The Obelisk is alongside of its destination, and the removal of its iron case is being commenced. We postpone particulars, however, till the work is further advanced.

"LA CAPITANIA GENERAL DE PUERTOS" AT BUENOS AYRES.

THE "Capitania" in Buenos Ayres has been erected from the designs of the architect of the Post-office, Mr. Åberg. It forms the headquarters of the port captain-general, under whose orders are all the other ports of the Republic. The duty of this official is to exercise a supervision of the river police and pilots, and to regulate generally all matters appertaining to shipping and kindred affairs.

The building is situate immediately in front of the passengers' mole, and is, consequently, the first and most prominent object attracting attention on landing. It extends from the beach to the street behind, which is on a higher level, and here is installed the Department of Agriculture, immediately in front of the English church.

All the offices requisite for such an establishment are found conveniently arranged. On the ground floor is a large open court, and the general quarters for the sailors attached to the department. Above are the apartments of the captain-general, and rising from the roof is a square signal tower, whence is obtained an excellent view of the river and the shipping in the outer roads.

Singular to say, the present occupant of the post of captain-general is a doctor in medicine.

The total cost of the entire building is about 16,000*l.*

MEDALS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE last ordinary general meeting of this Institute for session 1877-78 was held on Monday evening last at Conduit-street, Mr. Charles Barry, president, in the chair.

Mr. W. H. White, the secretary, announced the decease of Mr. Matthew Thompson, of Newcastle-on-Tyne, Fellow.*

Mr. F. P. Cockerell introduced to the president M. Charles Lucas, who had been deputed by the Société Centrale des Architectes, Paris, to represent that body at the Conference. Mr. Cockerell also read the following letter:—

"Société Centrale des Architectes,
Fondée en 1840, Déclarée d'Utilité Publique en 1865,
Séant à Paris, Quaí de l'Horloge, No. 23.

Paris, *le* 29 *Mai*, 1878.

À Monsieur Charles Barry, Président de l'Institut Royal des Architectes Britanniques.

Monsieur et Honoré President,—La Société Centrale des Architectes étant dans le désir de se faire représenter à la Conférence Générale qui doit s'ouvrir à Londres le 3 Juin, 1878, a désigné Monsieur Charles Lucas, Secrétaire-rédacteur pour assister à cette Conférence et lui en rendre compte.

Nous vous prions donc, Monsieur et honoré Président, de vouloir bien considérer Monsieur Charles Lucas comme Délégué de la Société Centrale, et de lui communiquer, à ce titre, tous les documents de nature à l'aider dans sa mission.

Veuillez agréer, Monsieur et honoré Président, l'assurance de notre considération de la plus distinguée.

Pour le Président, Membre de l'Institut,
Le Vice-Président,
EDMOND DE JOLY.

Pour le Secrétaire-principal, le Secrétaire-adjoint,
E. CERNESSON."

Among the recommendations for membership read, there occurred the names of Mr. John Oldrid Scott, who desired to be admitted as a Fellow; Lord Seaton, who sought to become an Honorary Associate; Mr. Charles Edward Barry (a son of the president), who desired to be admitted as an Associate; and Mr. Charles Henman, an old Fellow of the Institute, who wished to be transferred to the class of Honorary Associates.

The following gentlemen were then balloted for and duly elected, viz.,—As Fellows: Mr. Edward Hughes,† of Huddersfield; and Mr. James Thompson, of Glasgow; as Honorary Associate: Mr. John Clutton, of Whitehall-place.

The secretary announced several donations to the library, including two drawings of Venice, presented by the widow of the late Mr. Wightwick. Thanks were accorded to the donors.

The President also called attention to a number of engravings of old city churches in London, which had been secured by Mr. Kershaw, the zealous librarian, who was ever on the alert to make the Institute collection of engravings of these churches as complete as possible.

* Recorded, with some particulars of his career, in the *Builder*, p. 543, *ante*.

† As mentioned by Professor Donaldson, Mr. Hughes's nomination paper was signed by the late Sir Gilbert Scott, and is probably the last official document connected with the Institute bearing his signature.

THE ROYAL GOLD MEDAL.

The President, addressing Mr. Waterhouse said:—It is a personal gratification to me that it becomes my duty this evening to be the medium of conveying to you the outward symbol of the high esteem in which you are held by your professional colleagues. It is unnecessary for me to explain to you, an old member of this Institute, the meaning and intent of the Queen's Gold Medal, which has now for many years been so graciously committed to our body, and as to the annual destination of which her Majesty is always ready to take our advice. No personal favour originates or can confer this honour. It is absolutely free and open to those—and those only—who, in the opinion of their colleagues and rivals, merit it. This being so, I can sympathise with and fully appreciate the feelings of pardonable pride with which you will receive it.

You have this year been chosen by your colleagues here from among many worthy men and eminent architects like yourself. The Council's recommendation has been ratified and endorsed by the concurrence and approval of all the members of this Institute, and you deservedly find yourself one in a list of eminent men to whom this medal has before been accorded. Their ranks have unhappily been recently thinned by the death of some of those most distinguished amongst them in the past and present generation; but their places will, I cannot doubt, be filled by those who, as in your case, are no unworthy successors.

That this is no metropolitan honour, but an Imperial one, is evidenced by the choice in you of a man who, beginning his practice in the provinces,—becoming there by his rare merit distinguished as an architect,—has followed up that early promise by coming to London, there also to hold his own and increase his fame by the erection in the metropolis of buildings which are worthy sequels to his provincial triumphs in such works as the Assize Courts, Owen's College, and, latterly, the magnificent Town-hall of Manchester. Here in London your fame may well rest on so successful a work as the Natural History Museum promises to be when it has been completed and received its final impress from your hand.

I can well believe that the well-known modesty of your disposition will shrink from these references to your title to receive this medal, but as president of this Institute it is my duty, even if it were not my pleasure, to record some few of the works which own you as their author. Besides those to which I have referred, it is but right to allude to the great works done by you at Balliol, Pembroke, and Caius Colleges at Cambridge, to your great hotel at Liverpool, and the Seamen's Orphanage in that city, to the numerous mansions of our nobility to which you have added architectural beauties,—in all parts of England,—of which I will spare your susceptibility the detailed list, as they are doubtless well known to, and admired by, many now in this room. Suffice it to say that whether in municipal, ecclesiastical, or domestic works you have fully shown yourself, in the best of all senses, "A Master Mason."

We in this Institute are not alone in according to you well-merited honour. It is pleasing to us to remember that this present year has seen you elected as an Associate of the Royal Academy, and we feel that in your person that body has only justified its own position in professing to be the representative of all the fine arts amongst which we architects proudly claim that our art should be recognised to even a larger extent than is or has been the practice of that rather exclusive body.

May you live long to enjoy the honour thus conferred upon you, and I hope I do not misunderstand the ambition of a true architect if I anticipate that this honour done you by your compeers will be amongst those most cherished by you, whatever higher or further dignities may be in store for you.

Mr. Waterhouse, who was very cordially received, replied as follows:—Mr. President and gentlemen,—It is somewhat unfortunate that when one most wants words, they are not at his command. I wish I had them to-night, and fitting words, to express to you the deep sense I have of the honour you have done me in recommending to her gracious Majesty my name as that of your chosen recipient of the gold medal this

year. This distinguished honour has come upon me very unexpectedly. I have no right, I feel, to criticise in any way the award in this case; but, Mr. President, in the midst of the flattering words you have just uttered, you have forgotten to mention one circumstance which I think I shall not be improperly revealing "state secrets" in mentioning now, and that is, that if one or two members of the Council,—I speak for myself as one,—had done their duty as they ought to have done, somebody else would have been making this acknowledgment to you now—("No, no."). I cannot conceal from myself, gentlemen, that there are others who have claims to this great honour far in excess of my own. Of course it would be idle in me, after the long catalogue of my shortcomings that the President has presented you with, to pretend that I have not had great opportunities, thanks to those who have accorded to me their generous confidence; but I confess it is somewhat humbling to me to reflect that there are others who have had fewer opportunities, but who yet have done better work, who have not yet had their gold medal. These reflections have forced themselves upon me repeatedly since the day I heard of your generous determination to award me this most distinguished proof of your regard. Many of those, and, indeed, I may say *all* of those, who have preceded me in this high honour, have been men who have been distinguished for their learning and attainments in a way that I can make no approach to: they have been distinguished for archæological knowledge and research as well as for their genius as practical architects. I accept this medal at your hands as a proof that you are willing to recognise one who would put in a plea for architecture to be considered, on *some* occasions at any rate, as distinct from style or archæology. I thank you, in conclusion, most heartily. You have given me a possession which will always be amongst the most precious that I can possibly have, and it will not only be felt so by me, but by all my descendants as long as I have any. (Mr. Waterhouse was repeatedly cheered during his speech).

OTHER MEDALS AND PRIZES.

The President then proceeded to distribute the other medals and prizes offered by or through the Institute, the recipients being warmly applauded. Mr. Barry said:—It is now my pleasure to aware the prizes which have been gained in the various competitions which have taken place during the past year within the walls of the Institute. The *Soane Medallion** has been worthily gained this year, in a contest between more than the usual number of competitors, by Mr. H. M. Robinson, who is unfortunately ill and unable to be here to receive it. The secretary, in transmitting it, will, I am sure, convey to him that appreciation of his merit which you would have manifested by your applause had Mr. Robinson himself been here. The *Tite Prize* of 30*l.*, which was not awarded last year, has this year been gained, and fully gained, by Mr. Henry Tanner. I have much pleasure in presenting Mr. Tanner with this prize. The name of it brings back to our memories one of the most practical architects who ever lived, but who has now passed away. He who gains this prize must needs be a practical man himself. The *Grissell Gold Medal* has been gained by Mr. W. G. B. Lewis. This prize was founded by a very hard-working and successful man, and I hope Mr. Lewis will be like him. An extra prize, a *Medal of Merit*, in the same competition, has been awarded to Mr. J. Martin Brooks, whose father is well known in this room as a very old and esteemed member of ours, and it must be a pleasure to him, as it is to us, to see one of his sons coming forward thus early and gaining one of our prizes. The *Institute Medal* and 5*l.* 5s. have been awarded to Mr. G. H. Shackell. This is the first prize Mr. Shackell has gained here: I trust it will not be the last. An extra prize, in the shape of a *Medal of Merit*, has been awarded in the same competition to Mr. Fred. Pinches, who is, unfortunately, not here to receive it. A second extra prize, in the form of a *Certificate of Honourable Mention*, has been awarded to Mr. B. Priestly Shires. This is the third prize in the competition: Mr. Shires will, I hope, let it lead to the first. The *Pugin Travelling Studentship*, which always attracts a great many competitors, has been gained this year by Mr. G. W. Browne. I am sorry Mr. Browne is not here, as I should have liked to introduce him to you. I am sure he will in future days be known to many of us. He has, as I have already announced, gained the Pugin Studentship this year, and gained it very worthily. The competition for the studentship always seems to be very attractive, and results in the production of some excellent drawings. This was peculiarly the case this year; in fact, there has been so much excellent work submitted that there was a general desire on the part of the Council to award extra prizes. The generosity of an old and respected member of the Institute, now, alas! deceased (Mr. Edmund Sharpe), enabled them to award as an extra prize the *Sharpe Prize* of 10*l.*, which has been gained by Mr. W. J. Millard. It is offered in the shape of books, which will enable Mr. Millard to proceed with the studies which he has so successfully entered upon. In addition to this, the Council felt that a second extra prize, in the form of a *Medal of Merit*, was due to Mr. Sydney Vacher, who was only third on the list because there were a first and second. With this pleasing ceremony we conclude the ordinary business of our session,—a session which has been one of some degree of labour and trial, but one fraught with a great deal of happiness to many of us.

The General Conference of Architects then commenced its deliberations. We give elsewhere a copious report of the first four days' proceedings, as also of the Institute Dinner, which took place on Tuesday evening.

* With the sum of 50*l.*, added under the usual conditions of Continental study.

MYCENÆ.

On the 29th ult., at the Society of Arts, Mr. William Simpson read a paper on "Mycenæ, Troy, and Ephesus," illustrated by a large number of his own capital drawings and sketches. It will be found in the journal of the Society, where those who are interested in the questions raised by Dr. Schliemann will doubtless seek it. We print a portion of Mr. Simpson's observations on Mycenæ:—

Mycenæ was, according to the story, the capital of King Agamemnon, who commanded the Greeks in the expedition to Troy. It is almost hidden in a corner of the plain of Argos, where it is situated in a ravine between two prominent hills. Portions of the old walls forming the Acropolis are still standing. Some parts of them are yet good, and in such condition that they might be useful for defence in the present day. Without the walls are the remains of some tombs, and a fragment of an old Cyclopean bridge; and that may be said to be all that has been left of the ancient capital of Argos. It is not much, but when time is considered, we may marvel that even this much has been left to us. According to the usually accepted history, Mycenæ was destroyed in the year B.C. 468, and the place was supposed to have been deserted at that time, and to have remained so ever since. The absence of population may perhaps explain why it has withstood the ravages of so many years; to this may be added the lucky circumstance that there was also no town close at hand to use the old walls as a convenient quarry. The place seems at a very early date to have dropped out of history, and to have been lost, or, at least, forgotten; to these causes, perhaps, we owe the existence of some most interesting specimens of early building, and the safe preservation of the oldest specimen of sculpture in Greece, that is, the lions over the gate of the Acropolis. This obscurity in which Mycenæ was shrouded can be evideneed by what Strabo says, for he states that it had been razed by the Argives, and that in his time not a trace of the city was to be seen (lib. vii., c. iv., 10). The out-of-the-way corner in which this old city] stands, may explain why so little was known of it, and will account for Strabo not finding the spot, or it may lead us to understand why those whose information he had trusted chanced to be unconscious that the old Cyclopean walls were still visible.

A century and a half later, Pausanias seems to have had more success in seeking for the capital of Agamemnon, and his description of it is so exact that we may assume he visited the spot and saw it with his own eyes. As this author writes with all the minuteness of an inventory, it may be as well to give his words. He says,—

"Among other parts, however, of the enclosure which still remains, a gate is perceived with lions standing on it, and they report that these were the work of the Cyclopes, who also made for Prœtus the wall in Tiryns. But among the ruins of Mycenæ there is a fountain, called Perseа, and subterraneous habitations of Atreus and his sons, in which they deposited their treasures. There is also a sepulchre of Atreus, and of all those who, returning from Troy with Agamemnon, were slain at a banquet by Ægistheus. For there is a dispute between the Lacedæmonians, who inhabit Amyclæ, and the Mycenæans, concerning the sepulchre of Cassandra. There is also a tomb here of Agamemnon, and of his charioteer, Eurymedon, and one sepulchre in common of Teledamus and Pelops, who, as they report, were twins, and the offspring of Cassandra, and who, while they were infants, were slain by Ægistheus at the tomb of their parents. There is likewise a sepulchre of Electra, for she was given by Orestes in marriage to Pylades, from whom, according to Hellanicus, she bore two sons, Medon and Strophius. But Clytemnestra and Ægistheus are buried at a little distance from the walls; for they were not thought worthy of burial within the walls, where Agamemnon and those that fell with him were interred." (lib. ii., c. xvi.)

Although these words were written over seventeen centuries ago, in the main they give a fair account of the place as it exists at this moment.

The principal part of the walls are of the most primitive style of Cyclopean masonry; that is, of large and seemingly unhewn stones, without mortar or cement of any kind. Where such rough stones leave wide spaces between, these openings are filled up with smaller stones. . . . .

Many suggestions have been made by way of explanation of these two lions and the pillar, but as yet no definite conclusion has been arrived at. One theory is that the pillar was a symbol which had reference to the Persian solar worship,—another conjecture made the pillar sacred to Apollo under the title of Agyieus, in which character Apollo was the guardian of streets and public places, and that he would thus be the appropriate deity of gates and vestibules. I will give a quotation from the "Iphigenia in Tauris," which we may suppose is an authority on matters of this kind. It is Iphigenia, the daughter of Agamemnon, who speaks. She says:—

"Methought, that having changed this barb'rous land
For my dear native Argos, there once more
I dwelt and slept amid my virgin train;
When, lo! a sudden earthquake shook the ground;
I from the tott'ring chamber frighted fled,
And where I stood aloof, methought, beheld
The battlements disjointed, and the roof
From its aërial height come tumbling down.
One only pillar, as it seem'd, remain'd
Of all my father's house; whose capital
Was with dishevell'd golden tresses hung,
And, stranger yet, with human speech endow'd.
This pillar, reverently acting then,
The duties of the function here enjoin'd me,
I purified with water, as ordain'd
For sacrifice, and as I wash'd, I wept."—v. 44.

This only pillar she identifies with her brother Orestes, and a few lines further on she adds:—"For sons are pillars of a family." As representing the son, the pillar is thus a symbol of the continuation of the family, and of the stability of the house. To this Iphigenia adds another function, which is quite in keeping with the involved nature of ancient symbolism. She, believing that her brother was dead, purified the pillar with water, as ordained for sacrifice, thus making it a funeral stele, or altar. The lions, in this view of the subject, would thus become the guardians of this sacred column, and at the same time they would be the guardians of the gate, and of the house of Pelops. It would be curious if the lions at church doors, which were common about the twelfth century in Italy, could be traced back to this ancient example at Mycenæ. The gate, as a seat of justice, is most ancient, and the church-door became a place, in the Middle Ages, where decrees were published; the lions were such a recognised feature of the door, that many of the proclamations and documents began with the formula of "*Inter Leones*." (De Caumont, p. 168.)

Another important consideration is the origin of the style of sculpture on this slab. Up to the present, scarce even a guess can be made as to the date which ought to be assigned to it. The art upon it is good,—so good that it implies progress and a considerable period of time to reach the condition of culture necessary to produce such work. It stands alone, and unconnected with any other specimens of art in Greece. We have no other works which could be pointed to as the steps leading to the state of development indicated in the high finish of these lions. They seem to belong to a different school from that of the later Greek art. The problem has been as to where the influence which produced this style came from. The usual explanation has been that of an Asiatic contact. This theory, of course, involves the still broader theory that the first influence which gave birth to Hellenic art came from Asia. The strong resemblance in the style of art on these lions at Mycenæ and the sculptures

from Nineveh, has naturally led to the supposition that the style came originally from the valley of the Euphrates. Or it may have been in some allied school which flourished in Phœnicia, for we know from Homer that Sidonian art was, at an early period, much valued by the Greeks. From the most remote period there was a constant communication between Greece and the north-west corner of Asia Minor, and this link would also explain how art-knowledge, or even the artists themselves, might be transported from the one region to the other. The story of Pelops coming from Lydia, and being able to give his name to the whole Peloponnesus, may be partly, or even wholly, mythical; and yet the probability is, that some migration of power, or of race, took place, and with it would, no doubt, be carried whatever superiority in art the invading race may have chanced to possess. The Greek authorities seem also to favour this idea. Pausanias states,—and we may suppose that he gives the explanation which was current at his time,—that the gate and the lions upon it were the work of the Cyclops, "who also made for Prœtus the wall in Tiryns." Now, Prœtus, according to the story, had been for some time an exile from the Peloponnesus, at the court of Iobates, the king of Lycia, and from Strabo we learn that the Cyclopes came from Lycia. Thus far there seems to be an agreement in the tradition as to the direction from which these workmen came. When we ask as to who or what these Cyclopes were, nothing like a satisfactory answer can be derived from the allusions to them which we find in the Greek authors. According to Strabo, there were seven of them, and they were called Gasterocheires, or "hands and stomachs," because they subsisted by means of their art. These Cyclopes from Asia seem a very different race from those described as belonging to Sicily, who had only one eye in the middle of their foreheads. The only point of resemblance between them was, that both were connected with labour and with art. Those of Sicily were supposed to be the assistants of Vulcan, and were, of course, metal-workers, whilst the Cyclopes of Asia were stone-builders. As the stone age dates before that of bronze, we may assume it as probable that the Asiatic Cyclopes belonged to a more primitive period. The questions connected with these ancient art-workmen are very important, and are very tempting to go further into in a paper for a society such as the Society of Arts, but I must limit my remarks, and proceed with the subject. . . . .

It was just within the Gate of the Lions, and close to the outer wall of the Acropolis, where Dr. Schliemann made his excavations. Here he came upon the five tombs,—a sixth has since been discovered by M. Stamataki,—which yielded such a harvest of golden treasures. Instantly on discovering these tombs, Dr. Schliemann declared to the world that he had found the graves of Agamemnon and of those killed with him, by Ægistheus, on their return from Troy. The value of this declaration may be estimated when it is known that our best archæological authorities on such matters, both here and on the Continent, cannot agree as to the probable date of the objects which have been found; and I may add, that there is a very wide interval of time implied in this uncertainty by the various theories which have been suggested. The few sculptured stones which were brought to light most certainly do not belong to the same style of art as that on the Gate of the Lions. The work on the lions is good, and the men who produced them are fully entitled to be called artists; but it would be an abuse of that term to apply it to those who executed the ornaments and figures on the stones lately found in the excavations of Mycenæ. Whether they belong to a primitive period, and were the early efforts of art, or that they indicate a deterioration in taste, and ought to have a late date assigned to them, is one of the questions at issue; and, unfortunately, the materials necessary to guide us in giving a judgment on such a point are as yet rather scanty.

One very remarkable monument was uncovered in these excavations, and it might be said that every feature connected with it was new to the student of Greek archæology. On this account it was rather a puzzle to explain its purpose. When fully laid bare, it presented much the appearance of being what we understand by a Druidic circle. A close inspection showed that the slabs had been wrought, and that they were carefully fitted to each other; round a portion of the circle a second circle of slabs was still standing; this second circle was concentric with the first, and only about 3 ft. apart; at one place there remained a few slabs, which formed a covering between the two circles. These horizontal slabs were mortised into the perpendiculars. That these covering slabs were originally all round the circle was evidenced by the existence of the mortises on many of the upright slabs. These were distinctly visible, and the conclusion which had to be formed from this was, that when the structure was complete, it must have formed a circular ledge or seat. It was nearly 100 ft. in diameter, and the whole suggested the idea of an arena, or place for some public performance. At the point of the circle nearest to the Gate of the Lions the entrance to this enclosure still remains.

It was while sketching on the spot that I was able thus to realise what the place had been at first, and recalling the description of the Shield of Achilles, where there is a crowded assembly, and the trial of a case is going, the poet says, that "the elders sat upon polished stones, in a sacred circle" (Iliad, lib. xviii., v. 503). The word rendered "polished" might also be given as "smoothed," or "worked," as applied to the stones; and thus we have a Homeric description which agrees perfectly with this discovery at Mycenæ. On sending home my sketches to the *Illustrated London News* of the spot, I suggested this explanation of it, and in addition to the account in the Shield of Achilles, I added a reference to the Agora of the Phæcians (Odyssey, vi., v. 265), which is also described as being round in form. Additional references have been made by others as to the circular character of ancient Greek Agoras, and this theory is now that which is generally accepted in regard to this monument.

It would be a very important point if it could be determined whether the Agora was appointed at this spot after the tombs, or if the important personages had been buried there as a mark of honour. Instances of Agoras, with tombs and monumental shrines within them, did exist. Pausanias mentions that among the Megarenses there is a senate in the place which was said to be the sepulchre of Timalcus (lib. i., 42). He also states that these same people built their place of consultation "in such a manner that the sepulchre of heroes might be contained within its ambit" (lib. ix., 43). In the city of Elæa he also mentions a stone sepulchre, and states that it "is in that part of the forum which is in the open air" (lib. ix., 5). Themistocles died at Magnesia, where he was buried, and according to Plutarch a very handsome monument was erected to him, "which still remains in the market-place." Herodotus states that "there was, and still is, a shrine dedicated to Adrastus, son of Talaus, in the very forum of the Sicyonians" (v. 67). In the Agora of Corinth, according to Zenophon, there was the sepulchre of Euphron. Some of these instances seem to imply that the place of public assembly was arranged so that the ashes of the heroes who were buried there would give a sanctity to the place. The circle of stones upon which the elders sat, as described on the Shield of Achilles, is called a "Sacred Circle," which confirms this idea. Where persons of distinction have been interred in an Agora, or had a sepulchral monument raised to them, it has evidently been done as a mark of high honour. Hence, in whatever way we may interpret the graves discovered in the Agora of Mycenæ, we need not hesitate to accept the theory that they were individuals of high repute, and that they must have been held in considerable honour by the inhabitants of the place. The amount of golden objects found with the bodies, the value of which has been estimated as equal to 5,000 British sovereigns, becomes another evidence in confirmation of this.

There is another class of monument at Mycenæ which I consider to be of great importance, as bearing not only on the archæology of that place, but also in relation to the whole question of the origin of Greek art or architecture. These are the so-called Treasuries, of which there are two almost perfect specimens at Mycenæ, and a number of smaller and ruder examples as well. There are others in various parts of Greece, one of the best known amongst these being the Treasury of Minyas, at Orchomenus. Still, none of these are in such good preservation as that of the so-called Treasury of Atreus. It is a splendid dome of wrought rectangular stones, about 50 ft. in diameter, and about the same in height. The stones are laid in courses horizontally, and not arranged on the principle of the arch, this being the primitive mode of construction for domes nearly all over the East. The stones of this dome are not large, but the entrance is formed with two very large blocks, which do duty as lintels. One of these, the inner one, is 27 ft. long, 17 ft. wide, and 3 ft. 9 in. thick. The second block is not so large as this, but still is an enormous mass of stone. Strong as these blocks are, the builders here again give us an illustration of the care with which they did their work, for over these huge lintels they have left a triangular opening similar to that at the Gate of the Lions, so as to relieve them from the weight of what was above, thus identifying the two structures as belonging to the same school of architecture.

In speaking of this monument I have used the term "so-called Treasury," and I have done this because I dissent entirely as to the character which is thus implied by the name. I had been familiar with the structure before my visit to Mycenæ from the usual representations of it in architectural works, but I had never thought seriously as to its purpose. An inspection of a building on the spot leads to a more intimate knowledge, and the mind at the same time generally demands an answer to such questions as the why and the wherefore. A very few minutes' inspection was enough to satisfy me that this monument was an ancient tomb, and I see no reason yet to alter that judgment. The influence which led me to this conclusion was that I felt myself forced to accept the fact that it belonged to that class of ancient monuments which are described as "chambered tumuli." It so happens that I have seen and made drawings of a good many of these monuments in various parts of the world, from our own prehistoric burial mounds even as far as the old tombs of the Myng dynasty near the great wall of China. Within this very wide geographical space there are some considerable differences in the ancient places of sepulture, still there are some marked features which are common to a large class of them, and these features are to be found in the Mycenæ examples. The so-called Treasury of Atreus being formed into the side of a hill, its character of being a tumulus is not at first apparent, still we can yet see that the earth has been heaped up over the top of the dome, just sufficient to tell us that it is a heaped-up mound. All doubt is removed by the character of the third and fourth so-called treasuries, which are not dug out of a hill side, and when they were constructed must have stood up as distinct mounds. That these structures were not treasuries, in the usual meaning of that word, can be made very evident. Had Atreus, or any other king of "rich Mycenæ," ever made for himself buildings in which to deposit his wealth, he would have made such places within the walls of the Acropolis. Security would have been the first consideration, and that such was not the purpose of those who constructed these so-called treasuries is evident from the fact that they are not within the old Cyclopean walls of the stronghold. This entirely precludes the notion that their object was the keeping of valuables. As they cannot have been treasuries, we have necessarily to fall back on their character of being tombs. Here only can we find safe footing, for we can explain that it was owing to their being tombs that they derived the reputation of being treasuries. All over the East every large and important tomb was looked upon in the past, and is so considered down even to the present moment, as being the depository of wealth. The pyramids of Egypt have always been supposed to contain immense treasures. The great mounds of the Bin Tepé, near Sardis, are also supposed by the people in the region to contain unheard of wealth, which will yet be found when these old burial heaps are opened. Thus it is easy to explain why these ancient places of sepulture have attached to them the name of "Treasuries."

I think it is important to realise the true character of these remains, for Dr. Schliemann has, in his work lately published, entirely ignored their claim to be considered tombs. Accepting them in this light, I think that the next conclusion must be that these are the tombs mentioned by Pausanias in the quotation which has already been given. It will now be understood why Dr. Schliemann refuses to admit the sepulchral character of these monuments, for he claims that the tombs discovered by him in the Acropolis are those mentioned by that author. The probabilities against his theory

are supplied by himself. In his work on Mycenæ, at p. 102, he asserts in a very positive manner that he has found the sepulchres as described by Pausanias, yet he is forced to confess that the tombs which he has lately excavated, as well as what he calls the tombstones above, could not have been seen by Pausanias, for "when he (Pausanias) visited Mycenæ, about 170 A.D., all the sepulchral monuments had for ages been covered by a layer of prehistoric *débris*, from 8 ft. to 10 ft. thick, on which an Hellenic city had been built, and had again been abandoned about four centuries before his time, after having added a layer of Hellenic ruins, 3 ft. thick, to the deep strata of pre-historic remains. Thus, he could only have known of the existence of these sepulchres by tradition." The statement in this last sentence being given without any reason to support it, it must go for what it is worth. The probability of a tradition lasting for so many centuries, and coming down from a pre-historic age after all outward trace of the grave have disappeared beneath so many layers of rubbish, does not commend itself to our minds. Neither does it commend itself as agreeing with the words of Pausanias, who makes no allusion to any tradition, but speaks of the tombs as existing, and refers to them in the same terms as he does to the wall and the Gate of the Lions; hence, we may suppose that he saw them on his visit.

There is one very important point which I wish I could do justice to in this paper, but I can only allude to it, and that is, that these so-called treasuries and the Gate of the Lions belong to a style of architecture entirely different from that which we have been accustomed to call Greek. The term Pelasgic has been applied to all early Hellenic remains; but the word, like many others, is a doubtful one, particularly as we do not as yet know from what source the influence came, nor are we quite certain of the race who first produced it. This much we may safely say, that it is older than the style which we associate with the idea of Classic Greek. We can also say that this style had an entirely different origin from that of the later Greek. The Greek temple is an imitation, in stone or marble, of a pre-existing wooden type. The Mycenæ remains have not the slightest indication of a wooden origin. The style began from the first with stone, and with the placing of one stone on the top of another. Most probably the rude Cyclopian walls were the first efforts at it. The third and fourth treasuries are very primitive attempts; in fact, they are more like the dolmens of our own Druidic monuments than anything else. In them we can see the rude beginnings of the style which led ultimately to such a splendid monument as the so-called Treasury of Atreus. Its substantial masonry has endured through a long course of ages, showing the careful work of its builders. It was all covered within with bronze. The holes of the bronze nails are still visible. In the British Museum there are one or two fragments of marble, with ornament upon them, which are supposed to have been part of the ornamental incrustation which was originally over the whole of the doorway, and of which Professor Donaldson made a restoration over thirty years ago.

I have identified the style of architecture of these monuments with that of the Gate of the Lions. The supposition that the builders of these last came from Asia Minor has to depend upon what is little better than traditional evidence, but this evidence finds support in the following quotations from Athenæus, which bears on the original constructors of these tumuli. He says, "You can see everywhere in the Peloponnesus, but especially in Lacedæmon, very large mounds which they call the tombs of the Phrygians, who came with Pelops" (xiv. 12). Athenæus is a late author; still, whatever value this statement may have, it goes so far to prove that those who introduced these mounds into Greece were the same as the Cyclopes, whoever they may have been; and it is also evidence that these mounds were not treasuries, but were tombs, as I have endeavoured to explain them. It may be added that Æschylus describes the tomb of Agamemnon as "the mound of his sepulchre" ("Choephori," v. 4). Sophocles does the same. He makes *Electra* say, "For when I came to my father's ancient tomb, I see from the top of the mound," &c. ("Electra," 894).

It does not seem to us that Dr. Schliemann's attribution of the indisputable tombs found by him is much damaged by the foregoing. It is right to add that Mr. Simpson's objections as to Dr. Schliemann's identification of the Homeric "Ilium" are stated with much less qualification than in the case of the Mycenæan tombs. Nevertheless, he is obliged to add,—"Although I consider these late explorations at Hissarlik as most unsatisfactory in regard to the identification of the Homeric Ilium, yet I would say, if such a place as Troy ever existed, I should give the preference to Hissarlik over that of Bounarbashi. The real truth is that neither of the localities can be reconciled with the Ilium; but Hissarlik, I think, presents the fewest difficulties."

THE HEALTH AND SEWAGE OF TOWNS.

CONFERENCE AT THE SOCIETY OF ARTS.

CONTINUING our report,* we have to note that the first subject dealt with in the course of the second day's proceedings was that of the discharge of sewage into the sea.

Mr. Henry Robinson, C.E., read a paper, in which he observed that,—

"A very general impression prevails that if a town is situated close to the sea it is necessarily in a more advantageous position than inland towns, respecting the disposal of its sewage, as it has only to avail itself of its proximity to the sea to get rid of its sewage by discharging into it. That this is an erroneous impression the experience of most of our watering-places proves, and it is therefore desirable to offer a caution to those who are contemplating adopting a similar course. In the Local Government Board Blue Book of 1876, one of the conclusions arrived at is as follows:—

'That towns, situate on the sea coast, or on tidal estuaries, may be allowed to turn sewage into the sea or estuary, below the line of low water, provided no nuisance is caused; and, that such mode of getting rid of sewage may be allowed and justified on the score of economy.'

This has been often quoted as encouraging the adoption of this method of sewage disposal, and it is to be regretted that the report gives no data whatever (such as are abundantly available), by which the qualifying expression, 'provided no nuisance is caused,' would be shown to apply to a great number, if not the majority of cases. It might have been stated that, to avoid a nuisance, the sewage must be discharged into the sea at a point not only below low-water, but where there is a well-ascertained current which would carry it permanently seaward. A point of discharge complying with these conditions is but seldom found to exist close to the town, but has to be reached by long and costly outfall sewers, or rather tunnels. At the outfalls there should be a continuous movement seaward during the twenty-four hours, instead of an oscillating action to and fro, resulting in a return of the sewage, and its deposition along the shore, not only at the outfall and its immediate neighbourhood, but also at distant places to which the tide carries. . . . .

The difficulties attending the discharge of sewage into the sea would be diminished were it not that it has a higher temperature and a lower specific gravity than sea or river water, which causes it to rise to the surface; and if it is not carried seaward at once, part of the suspended solid impurities are deposited on the coast wherever there is still water and no tidal current, whilst the rest of the suspended, together with the dissolved, impurities float on the surface, and are carried backwards and forwards by every tide, decomposing and liberating gases (sulphuretted hydrogen being one of the most offensive) injurious to health, and polluting the air.

In some cases, by means of long outfall sewers, the sewage is carried clear away from the place producing it, as at Brighton. These practically become elongated cesspools, in which noxious gases are generated, and are liable to be forced back into the town drains, and thence into the houses. In these long outfalls, also, the solids deposit, and involve both expense and difficulty to remove. Even if the places producing the sewage really get rid of it in this way, they are frequently simply transferring it to others, a set of the tide carrying it so as to cause mischief and nuisance elsewhere. . . . .

The authorities of Glasgow have had the question of how to get rid of their sewage under consideration for a long while. A Royal Commission investigated this case, and although the result of this was to advise the adoption of a scheme to carry the sewage twenty-seven miles in a tunnel to the sea, at enormous cost, and although this advice was similar to that previously given, the authorities took the matter into their own hands, and appointed a committee of their body, which has recently presented an exceedingly able and interesting report, giving the results of their investigations. The conclusion they arrive at is not to adopt the recommendations to discharge their sewage into the sea, but to discharge it into the river Clyde after it has been purified by chemical treatment."

Mr. Shoolbred expressed a general concurrence with the views set forth by Mr. Robinson in his paper, and said that the common but erroneous idea that when the sewage was turned into the sea it was at once carried away, was due to a misconception as to the action of the tides. The tidal wave, or the influence caused by the tide on the motion of the water, was confounded with the tidal impulse, which was a force moving at a considerable rate over the whole surface of the water, at the rate, probably, of hundreds of miles an hour, but fortunately for the dwellers on the earth the tidal current did not travel at a greater rate than from six to eight miles an hour. It was too often the case that the casting of sewage into the sea resulted in the deposition of a loathsome slime upon the neighbouring coast. This had been the case at Liverpool, where the estuary of the Mersey had its banks covered with a slimy sewage deposit. This fact was recorded in the first part of the Rivers Pollution Commissioners' Report, as far back as 1869, and things were gradually getting worse, on account of increase of population. Great evil had been wrought in connexion with the discharge of sewage into the sea by the proneness of engineers and others to move in one groove. If sewage outlets had to be made into the sea, such points should, if possible, be fixed upon as would prevent the sewage being caused by tidal currents to return and impinge against the coast whence it was discharged. He had seen with great pleasure that at the congress on water supply, held two days previously, a resolution had been passed urging the desirability of dividing the country into water-shed areas for all purposes of water supply. He should like to see some similar geographical division made for purposes of sewage utilisation or removal.

After some remarks by Dr. Dominichetti, Mr. Cresswell, and Mr. Young,

Mr. Alcock, of Sunderland, moved the resolution of which we have already given the text.* It was seconded by Mr. Ernest Turner, and after a long and somewhat tedious discussion on various suggested verbal amendments, was carried unanimously. In the course of this discussion,

Dr. Wright, of Cheltenham, spoke of the desirability of adopting the principle laid down in the resolution. He said that at Charlton Kings a very good system of drainage was provided by the local authority; but it was afterwards found that many of the house-drains connecting with the sewer had been laid with the fall the wrong way! In his opinion nothing but a well-laid system of house-drains and public sewers would prevent the formation of sewer-gas, and it was of the utmost importance that all drains connecting with the sewers should be laid by the direction and under the control of the local authority.

Mr. Hewson, of Rochdale, said that pretty much the same powers as those mentioned in the resolution had been possessed by the corporation of Rochdale for the last five or six years, under a local Act, and had worked very satisfactorily. In Rochdale, all house-drains were laid by "authorised contractors," appointed by the corporation. The work was done at a fixed schedule of prices, and the result was a great gain to the ratepayers. Any attempt at overcharge, or any imperfection in the work done, rendered the offending contractor liable to be struck off the list and debarred from executing such work in the town. One clause in the local Act was to the effect that all drains, whether within or without the premises to which they belong, shall be under the surveillance and control of the corporation, and shall be altered, repaired, and kept in order, at the cost of the owner or owners. Wherever it could possibly be avoided, no drain was allowed to pass beneath a house, and every train was trapped and ventilated.

Dr. Holden, medical officer of health, Hull, said he supported the resolution because he felt that by it Mr. Alcock was hitting the right nail on the head. He could speak from experience of the great evils which arose from the very imperfect and scamped way in which house-drains were laid, especially in very many new dwellings. Speaking generally, he hoped the resolution would be made as strong as possible,—that, in fact, it would insist on compulsion. The word "may" might in all sanitary legislation be advantageously changed into "shall." So long as sanitary legislation was permissive and optional, so long would it be to a great extent inoperative, for, to serve their own purposes, speculating builders and others interested in house property got elected upon town councils and local boards, through raising the cries of "economy" and "protection of the ratepayers' pockets."

Dr. Lawrence Hamilton proposed an amendment in the following terms:—"It shall be the compulsory duty of the local authority to take into its own hands the complete system of house-drainage, which shall be executed at the cost of ratepayer or freeholder, as in each case may seem desirable to the said local authority." This amendment was subsequently withdrawn, at the instance of Dr. Child and the Chairman (Mr. Stansfeld), who pointed out that to enter into the question of cost would be to needlessly complicate the matter. It was sufficient for the Conference to lay down the broad general principle embodied in the resolution, leaving details

* See p. 555, *ante*.

* See p. 557, *ante*.

which would arise in the adoption of that principle for settlement as they arose.

Dr. Fox, of Cockermouth, supported the resolution, because he thought that if the powers mentioned in it were conferred upon local authorities the result would be to remove the objections entertained in some quarters to the water-closet system.

The discussion was continued by Mr. Walsh (Halifax), Dr. Yeld (Sunderland), Dr. Woodward (Worcester), the Mayor of Devonport, Captain Douglas Galton, Dr. Chesshire, and Dr. Syson, who all spoke in favour of the principle embodied in the resolution.

The Conference then proceeded to the discussion of the last item on its programme, viz., "Whether any further legislation, of a compulsory or permissive character, is needed for bringing about a better sanitary condition of towns or dwellings, or any change in imperial administration." On this subject,—

Mr. C. N. Cresswell, barrister-at-law, read a paper, in which he said:—

"Legislation has dragged its slow length along while events have galloped with portentous haste, and neither imperial nor local efforts keep pace with the needs and expectancy of the nation. In 1876, popular excitement induced a palliative measure in the Rivers Pollution Prevention Act, but that measure has failed of its purpose, and given to wrongdoers a quasi-legislative sanction for their delinquencies and incapacity. At the same time, the Thames Conservancy Acts of 1857 and 1867, after much ado about nothing, have suffered a palsy, and received their *quietus*,—for a time, at least,—in the Lower Thames Valley Drainage Act of last year. In the meantime, a cry has gone up for water,—water for the food and ablutions of man as well as the requirements of our great staple industries. Every river, from the Tay to the Dart, has been contaminated with the refuse of homestead or factory. The salmon kelts of Westmoreland and Cumberland are in process of destruction by a parasitic fungus plant, the newest development of sewage pollution; and, while professors dispute as to final causes, and means of prevention, the patient public waits for the *Deus ex machind*, in the form of some miraculous intervention to save them from the natural consequence of their own apathy and ignorance. In the presence of these and other startling phenomena, where shall we seek the signs of progress, or compute the net results of practical sanitation?

The national anxiety finds relief in a popular cry,—that form of generalisation so acceptable to shallow minds, inasmuch as it relieves them of the pain of thinking for themselves, and saves time by precluding argument.

Centralisation, it is said, is the fountain source of these sanitary shortcomings, and it is above all things needful to revivify the civic life and vigour of the people, in order to resist the centripetal tendencies of our time. It is but a half-truth, after all; for the action of a central authority is as necessary to the body-politic as the motive power of the heart to the circulation of the human system. Nevertheless that action may be strained and abused, as we see too plainly in the modern tendency towards meddling and muddling with subordinate authorities in matters beyond the scope, and outside the functions of, imperial control.

In this respect it may be expedient to reorganise the Local Government Department, and re-adjust it on its own proper bearings. Further legislation in this direction will rid us of that red-tape and circumlocution, which encompass every limb and paralyse the functions of local bodies, reducing independent self-government to the shadow of an empty name. From the investigation of a grand scheme of arterial drainage to the contents of a workhouse plum-pudding is a wide range of official supervision, yet nothing is too large or too minute for the elephantine prehension of the Whitehall department. There is a veritable plague of inspectors abroad, and the native stubbornness of the provincial mind, although it may need the spur and impulse of the central authority to set it in motion, resents this constant yoke of official supervision, which will not permit the expenditure of a few pounds or the construction of a workhouse pig-stye without a local inquiry and departmental sanction.

This was not the intent of those who framed the Public Health Acts, nor is the system compatible with the divine right of self-government. The functions of Imperial administration end where those of local self-government begin; each has its proper uses in the economy of the State; and there is scope enough for each within its own particular province. The Rivers Pollution Prevention Act is in point. Such is the superfluity of safeguards and precautions in the provisions of that Act, that none save a Government department would venture to put it in force—nor can a sanitary authority take any proceedings under it without the consent of the Local Government Board! Here then was a field for the energies of Government, where both the resources and influence of the State might be usefully employed.

Yet nothing has been done to enforce or direct the operation of an Act which is, as it were, still-born, and truly a most lame and impotent piece of legislation! On the contrary we can cite cases where local enterprise has been hampered; and official interference has blunted the edge of many a bold resolve on the part of those who have striven humbly but honestly to help themselves.

Reading and Oxford have been permitted to embark with a light heart upon a grand experiment of sewage utilisation, because the method of disposal coincides with the procrustean theories of the Local Government Board. According to the rigid formula now in vogue in high places, every authority is required to fit the same bed, and conform to the same standard, without regard to local conditions, or the measure of local resources. If we appeal for aid and light to the great central luminary, it makes but one sign; and recognises but one shibboleth in the darkness. Irrigation is their grand climacteric; and as all roads lead to Rome, so all official intervention tends in one direction. If the Government be right, this is the be-all and end-all of sanitary progress, and the Conference may dismiss all other modes of treatment as irrelevant and futile. It is a gloomy prospect for the Lower Thames Valley, where the suggestion sounds like a sorry jest, and land consists of tennis-lawns and croquet-ground relieved here and there by paddocks at a rent of 50*l.* per acre per annum. In this quarter, 'union of districts' is the latest development of sanitary enterprise, but the conception is still in the process of gestation, and when brought to maturity may prove to be a monster of terrible import and insatiable appetite. At present it is regarded with more sympathy by engineers, than by the ratepayers concerned, and despite the favourable augury of official approval their minds are disquieted within them. * * * *

There is, however, a ray of light in the darkness. The Bill now before Parliament for the constitution of County Financial Boards or Local Parliaments in every county, promises to unloose the deadlock of sanitary administration. The complex machine creaks upon its hinges, but a new lever is forthcoming to help on the work.

These county boards should do the work of local supervision, not only sanctioning loans, but granting them out of local funds contributed within the district, and secured by the best of all safeguards, viz., the resources of the immediate district, developed and improved by the expenditure of moneys so obtained. The power to authorise the purchase of lands for sanitary objects,—at present only attainable by an Act of the Imperial Legislature,—if conferred on these new constitutions, would relieve sanitary authorities from the elaborate procedure of the Lands Clauses Act, while the utilisation of local resources would put a stop to that drain on the national exchequer which has already excited alarm in high quarters. Those who furnish the means and those who sanction the outlay would alike be on the spot to watch and control the work, and thus, in lieu of local government in leading strings, hampered by perpetual inquiries, constant adjournments, delays, taught to look to Jupiter rather than to self-help, and leaning too often upon a broken reed, we should at length realise that kind of authority which our president [Mr. Stansfeld] foreshadowed from his place in Parliament as having 'vitality, cohesion, adaptability, strength enough to resist the centralising tendencies of the day,' and providing the means of political education for all classes of the people.

There are enough of questions to occupy the time and attention of superior authority at Whitehall. The Pollution of Rivers Act, the investigation of scientific processes, the definition of new areas, and simplification of old, the collation of statistical data in order to determine the course of future legislation,—these and cognate subjects appertain to imperial administration, and would enable the department to regain its proper sphere of usefulness. It is because the latest measure of Government has been conceived in this spirit, and is capable of still wider development in this direction, that it deserves the earnest support of the Conference; and we trust that members will not separate without recording their approval of the general scope of the Bill, thereby strengthening the hands of its supporters in and out of Parliament.

Having thus indicated the need of further legislation in three particular directions:—

1. The protection of the ballot in the election of members of local boards, in order to counteract the influence of small tenement proprietors, always and everywhere the interested opponents of sanitary progress.

2. The appointment of medical superintendents in each county or division of a county.

3. The first great step towards decentralisation by the constitution of county boards, so as to habituate the people to self-government, and prepare them for the eventual introduction of provincial Parliaments.

I have yet to mention another indispensable factor in the work of bringing about that 'better sanitary condition of towns and dwellings,' which is the real aim and object of these conferences, viz., a loyal resolve, on the part of all concerned, whether governors or governed, to do the work which they have undertaken to do. Local authorities do not move unless there be pressure from without as well as from within. It is not in the nature of such bodies to initiate improvements *mero motu*. Their bent and tendency is one of resistance to all reforms which involve a possible increase of the rates; nor can I recall a single instance during the past twenty years where a corporate body has volunteered to improve the condition of things around it, except the courts of law had applied the spur to the flank of their lagging energies. Sanitary progress is a monotonous tale of injunctions granted, or informations filed, at the instance of individual inhabitants, for the abatement of nuisances which the corporate authorities had suffered in silence, connived at, or ignored; and the reason is obvious, viz., that the boards consist in great part of the principal delinquents, or their satellites. Even Parliament is not proof against the canker of vested interests, and legislative measures 'of great pith and moment their currents turn awry' by reason of timid acquiescence or untimely concessions."

Sir Henry Cole said that although he was inclined to say a word on behalf of the Local Government Board, which, after all, could not be expected to be wiser than the people themselves, the pertinacity of the Board in insisting upon the adoption of one pet nostrum for the settlement of the sewage question had been justly condemned by the reader of the paper. The Board seemed to forget that its own officer, Mr. Rawlinson, in the report issued by the Board two years ago, said,—"Land irrigation is not practicable in all cases, and therefore other modes of dealing with sewage must be allowed." The Board, he thought, might be almost worth what it cost if it would collect and collate information as to the working of sanitary schemes and appliances. The experiences, whether of success or failure, and the causes which eventuated in success or failure, might be and ought to be systematically collected by the central authority, the Local Government Board, and periodically published, for the behoof of local sanitary authorities at large. As a case in point, Sir Henry directed attention to the excrement-tub used in Warrington. This, he remarked, was exceedingly simple, but he doubted whether the Local Government Board knew anything about it. In place of a costly spring lid or similar contrivance, to prevent the spilling of the contents of the tub, a piece of sackcloth was laid across the top before the wooden lid was put on, the cloth acting as a kind of lute, and preventing spilling. Sir Henry Cole referred to some returns on sanitary subjects recently presented to Parliament at the instance of Lords Stafford and Rosebery, and said that though these returns contained much valuable information they remained on the shelves of the Stationery Office, and the cost and trouble of preparing them was of little benefit to the public at large. It should be the business of the Local Government Board to give publicity to the valuable information which was to be found buried in Blue Books and Parliamentary papers. As to the sanitary state of London, it was a discredit to any and every Government which had been concerned in it that the metropolis was exempted from sanitary laws which were enforced in the provinces. It was a sort of "Arabian Nights" fact that the Metropolitan Board of Works enjoyed the monopoly of polluting the Thames. London, in fact, was the only place in the country which, to the scandal of sanitary legislation, had a prescriptive right to be beastly.

Mr. Henry Robinson, C.E., submitted the next paper. He endeavoured to show that some of the clauses of the Public Health Act Amendment Bill, as amended by the Select Committee, left the same opening for obstructiveness or indifference as in the past. He said,—

"The President of the Local Government Board stated in the House of Commons, this Session, that recent legislation on the subject had scarcely yet been allowed time to work, and that he saw no reason at present to seek for further compulsory powers on behalf of his department in reference to local authorities. It is to be hoped that a discussion at this Conference will tend to make the existing compulsory pravisions of the Public Health Act operative, and to even increase them by the Amendment Bill (not, however, as now drawn) to the fullest possible extent, as the time has arrived for the adoption of strong measures."

Dr. Lawrence Hamilton defended the Local Government Board on the ground that, in his opinion, it did its work, on the whole, very well,—a fact largely due to the ability of its medical, engineering, and chemical advisers. He devoutly hoped that the Warrington "stink-tub," so much admired by Sir Henry Cole, would not come into extensive use, which, indeed, it was not likely to do, for a more filthy contrivance it was difficult to conceive, and the dangling corners of the sackcloth, saturated as they would become with offensive matter, were eminently calculated to spread zymotic diseases broadcast.

Mr. Monson spoke strongly in favour of the adoption of vote by ballot in the sanitary as well as in the Parliamentary franchise, and mentioned several cases of coercion, intimidation, and corrupt practices by candidates for membership of local boards.

Mr. Alcock, of Sunderland, spoke of the great necessity which existed, on sanitary and other grounds, for the enactment of a general Building Act, applicable, as to its broad general principles, such as dimensions of bedrooms, height of ceilings, &c., to the whole of the country, but subject to such modification in detail as varying local circumstances and materials might render necessary or expedient.

Dr. Child said that the best argument in favour of further legislation was that existing legislation had almost completely failed in many respects. The Local Government Board needed reorganisation, for at present its administration was impeded and hampered by officialism and red-tape. In fact, it had carried to a perfection unknown in any other country this side of Turkey the art of "how *not* to do it."

Mr. Freeman, of East Dereham, spoke of what he alleged to be the arbitrary conduct of the Local Government Board and of its inspector, Major Hector Tulloch, in endeavouring to force a costly system of sewage irrigation upon that town, in spite of conditions which he (Mr. Freeman) and the local board thought to be adverse to the success of such a scheme. In this case, it was alleged, the Rural Sanitary Authority, which consisted mainly of farmers, had no interest in the town of East Dereham, as they did not reside there. The Rural Sanitary Authority had employed Mr. Baldwin Latham to prepare a scheme of drainage and irrigation which would cost 30,000*l.*, and the Local Government Board had endeavoured to bully the people of East Dereham into the adoption of that scheme.

Mr. Baldwin Latham denied that the scheme referred to by Mr. Freeman would cost 30,000*l.* In point of fact, less than half that sum was to be borrowed for works both of sewage and water supply. He asserted that the local board represented by Mr. Freeman had been formed with the sole object of "scotching" proposals for sanitary improvement.

Dr. Yeld, of Sunderland, read a paper on "the necessity for legislation empowering Urban Sanitary Authorities to prevent the proprietors

of houses erected before the constitution of local boards from building upon the whole of the open space belonging to such houses." He remarked that,—

"Whilst every facility is now given to local authorities by the Legislature for dealing with properties which, by reason of want of light, air, ventilation, and from other causes, are unfit for human habitation, and also for making bye-laws to regulate the building of new properties, in which provision can be made for a certain amount of space adjoining each house to be left for open-air space, no such provision is made whereby such authorities can deal with properties built before local boards were constituted; so that, unless some such provision be made, large sums of money may be spent on an improvement scheme in one part of a borough, whilst at the same time, in another portion of the same borough, a condition of things may be gradually coming into existence, similar, in many respects, to that which in the first instance made it necessary to put the Artisans' Dwellings Act into operation. These remarks apply more especially to municipal boroughs incorporated within the last forty years.

In the borough of Sunderland scarcely a Council meeting passes at which plans are not passed allowing owners of property to build upon open spaces attached to properties built before the Corporation came into existence.

The local authority is at present powerless to prevent such additional building going on. Some few years ago the Council brought an action to test their power in this respect, when the verdict was given against them, it being held 'That the building was not a new building within the meaning of the Act, but only an addition to an old building.'"

Dr. Syson said no doubt there was room,—and a great deal of room,—for further sanitary legislation, but it was questionable whether existing legislation had been taken advantage of to the fullest possible extent. In order to duly enforce existing powers, it was necessary to reorganise the Local Government Board, which at present hopelessly muddled up Poor Law work with Health work. He would constitute each of these a separate department. Only by such a reorganisation would the country get any valuable result for the enormous sums of money now annually spent in sanitary work. He was not averse to "permissive" legislation, as a matter of expediency, as we had to learn to walk before we could run.

Mr. Edwin Chadwick, C.B., said some strong things had been uttered about the Local Government Board, and those who made those statements should be called upon to substantiate them. He agreed with those who said that one function of the Board should be to collect into one focus the sanitary experience of the whole country, and that was now being done. Had the work been commenced some years ago, a great many of the questions which perplexed the Conference would have been settled, or in a fair way to be settled. It should not be forgotten, in the midst of the outcries against the Board, that one of its most important functions was the protection of reversions,—the watching over the interests of the ratepayers of the future. That was a very large function, and he was almost afraid that if the administration of the Board came to be inquired into very closely, it would be found that the Board had been, if anything, too lax on behalf of the future, and too prone to fall in with the schemes and proposals of the present day. One of the greatest misfortunes attendant upon the administration of the Local Government Board was that its chief, the president, was also a Cabinet Minister and a member of Parliament, and only held a political tenure of his office. Under these circumstances, it was impossible that he could give proper consideration to his duties, and the consequence was that they were delegated to secretaries and others. As so much had been said as to the mal-administration of the Local Government Board, he begged to move,—"That this Congress is of opinion that the organisation of the central sanitary authority, the Local Government Board, is grievously defective, and ought to be the subject of Parliamentary inquiry." He was sure that the Board would pass satisfactorily through the ordeal of such an investigation.

Ultimately, Mr. Chadwick withdrew this proposition.

Dr. North, medical officer of health, York, said it was possible to over-legislate on sanitary as on other questions, and such over-legislation was to be deprecated, especially if it tended too much towards centralisation. He thought that the compulsory powers conferred by sanitary legislation were sufficient on many points provided the local authorities saw to their enforcement.

The Chairman (the Right Hon. James Stansfeld, M.P.), in a speech of considerable length, summed up the two days' proceedings. He pointed out, with reference to amendments in the law, that the Public Health Consolidation Act of 1875 had the merit of dividing the subject matter, which was really local government, into a series of parts. This was a very convenient division, and was intended to facilitate future amending legislation, so that a private member might deal with the amendment of a part of the Bill without the necessity of rendering himself critically familiar with the whole enactment. It had been proposed that there should be separate imperial supervision for Poor Law matters and for public health matters. That was, that the Act should be repealed which added the Medical Department of the Privy Council to the Poor Law Board, and which converted the latter into the Local Government Board. That Act was his. He was responsible for it. It was therefore natural that he should defend it. He must say he did not think it would promote simplicity in organisation if the administration or the supervision of the administration of the Poor Law were separate from that of local Government; for in Poor Law administrations sanitary questions arose. Workhouses must be built in accordance with sanitary regulations; and paupers must be dealt with in accordance with sanitary laws. The right hon. gentleman expressed an opinion that it would be well to enlarge the area of local self-government, and by ennobling the work procure the best men of the neighbourhood to undertake it. That would be the case with county boards, upon whom he would put the duty of preventing the pollution of rivers, the conservancy of the rivers, and other powers, so that they should stand between the local sanitary authority and the Local Government Board. By the creation of county boards they would at once change the centre of gravity of the whole system. A county board could hold its own. It could not be dealt with by the Local Government Board in the same way that a local sanitary authority could. Passing then to the Local Government Board itself, Mr. Stansfeld remarked that, like other great departments of the State, it was admirably served, but he maintained that it needed to be reorganised, and that the permanent head should not be a secretary, but a manager, a man who, like Moltke, went about the office whistling, with his hands in his pockets, who never had a pen in his hands, but who did the thinking, and supervised his subordinates.

Mr. Cresswell then moved the resolution which we printed last week (p. 557) in favour of further legislation, especially with reference to County Boards, and this, having been carred unanimously,

On the motion of Dr. Syson, seconded by Mr. Chadwick, a vote of thanks was given to Mr. Stansfeld for his conduct in the chair.

The Chairman, in acknowledging the compliment, said he trusted these conferences would be continued in future years, and that the council would enlarge their scope. He then declared the Conference at an end.

Besides the papers of which we have already given the substance in our extended report, the following papers were submitted to the Conference, though not read, viz.:—"Additional Information respecting Water-carried Sewage-treatment," by Mr. J. C. Melliss, C.E.; "Water-carried Sewage and Cement Manufacture," by Mr. James Richards; "Sewage Precipitation," by Mr. William White; "Remarks on the Cost of Systems given in the Local Government Board Blue Book on Sewage," by Mr. J. C. Melliss, C.E.; and "On Some Defects in the Public Health Act Amendment Bill, as amended by the Select Committee of the House of Commons," by Dr. F. T. Bond. We may in a future issue complete our report of the Conference by giving summaries of these papers.

In connexion with the Conference, an exhibition of sanitary appliances was held in premises lately occupied by Messrs. Tod-Heatley & Co., adjoining the house of the Society of Arts. The exhibition was of more than usual interest and extent. We noticed amongst the exhibits Banner's patent ventilating cowls, traps, &c., with working models; specimens of iron pipes, traps, and so on, treated by Professor Barff's anti-corrosive process; a number of sluice-valves, stop-cocks, hydrants, &c., sent by Messrs. Beck & Co., of Great Suffolk-street; Bostel's valveless water-closet, in one piece of white earthenware; Boyle's well-known self-acting air-pump ventilators (with working models); Doulton's sanitary stoneware, Stanford's patent joints, Mansergh's trap, gullies, &c.; Harescough's patent spring-lid excreta receptacle; Hart, Son, Peard, & Co.'s ventilators in many forms; Hodges & Butler's silicated stone drain-pipes and paving slabs; Lambert & Son's water-waste preventers, fire-cocks, &c.; Moule's earth-closets; Muller's patent water-meter; Oakes & Robinson's patent filter-press, "for rapidly and economically extracting moisture from the semi-fluid products of sewage-precipitation works"; Parker's dry-earth closets; the "Pulsometer"; cement manufactured by Scott's Sewage Company from the sewage of Burnley; the Sanitary Engineering and Ventilating Company's appliances; Smeaton's trapless water-closets; Stott's system of ventilation as applied to sewers and to ships (shown by working models); Stiff's sanitary stoneware and "interceptor" sewer-air trap; the Union Water Meter Company's meters; and a variety of filters and other appliances by various patentees and manufacturers, too numerous to mention.

MEMORIAL OF THE LATE SIR GILBERT SCOTT, R.A.

MEETING IN THE CHAPTER-HOUSE, WESTMINSTER.

On Saturday last, a public meeting, convened under the auspices of a committee recently appointed at a meeting held at the Royal Architectural Museum, was, by permission of the Dean and Chapter, held in the Chapter-house of Westminster Abbey. Mr. A. J. B. Beresford Hope, M.P., president of the Museum, occupied the chair, in the absence of the Duke of Buccleuch, who had been expected to preside. The attendance was not numerous.

The Chairman, in opening the proceedings, said they were met to do honour to the memory of a great architect, none other than Sir Gilbert Scott, by whose genius the noble building in which they were then assembled had been called out of the abomination of desolation, and restored to its present condition. He was not only the restorer of that Chapter-house, but of innumerable other buildings, and he was, moreover, a great creator of buildings proceeding from his own design. It was proposed by the committee that the memorial should take the form of a brass or some personal monument of that kind, over, or, as nearly as possible over, the resting-place of Sir Gilbert Scott's remains. That was the first consideration, and a sub-committee might be appointed by the meeting to carry it out and make all necessary arrangements with the Dean and Chapter. This personal memorial would not, it was hoped, absorb all the money that the proposal to do honour to the memory of so great and good a man would call forth. With the residue it was proposed to establish a teachership or professorship in connexion with the Architectural Museum. This would be to continue a work in which Sir Gilbert Scott took the utmost interest,—a work, in fact, which he might almost be said to have died in doing. The Architectural Museum was greatly and mainly of his foundation. It was a labour of love to him in his prime, and when he was old and famous, and his time overtaxed, he gave himself up to the drudgery of compiling its catalogue. The object of the Museum was to teach the class of artists who did not exhibit in gilt frames, on private-view days or shilling days, but those who executed the carving, stained glass, metal-work, and enamel-work to be seen in so many of Sir Gilbert Scott's buildings,—in other words, the working artists who carried out the architect's designs,—the men who were seeking to equal the productions of their Mediæval predecessors. To devote money to the founding of a teachership would be to carry on Scott's own personal work in the Museum. In concluding his remarks, the chairman stated that he had received letters of apology for inability to attend from various noblemen and gentlemen, but before he named any of them he must refer to the absence of Mr. M. J. Lomax, the curator of the museum, who was prostrated by a very severe illness. Letters had been received from Mr. A. B. Mitford, secretary to the Office of Works; Lord John Manners, M.P.; Mr. Thomas Webster, R.A.; Mr. Calder Marshall, R.A.; Lord Harding; the Dean of Durham; the Bishop of Ripon; Sir Henry Hunt; Lord Ripon; Mr. T. H. Wyatt; Mr. Barry, president of the Institute; the Bishop of Carlisle; Lord Carnarvon; Mr. W. Cowper-Temple; Lord Alwyne Compton; Mr. E. W. Cooke, R.A.; Mr. J. F. Bateman, president of the Institution of Civil Engineers; and others of the Committee.

The Dean of Lichfield moved the following resolution:—

"That this meeting, desirous of commemorating the character, the genius, and the works of Sir Gilbert Scott, in some desirable and appropriate form, invites the assist-

ance of the public towards carrying out a personal memorial in Westminster Abbey, and the endowment of a professorship or studentship in connexion with the Architectural Museum."

The mover, in the course of his remarks, spoke in high terms of the personal qualities of Sir Gilbert. One of his most striking characteristics was his intense reality, combined with simplicity. He was thoroughly real in all that he did, and the enthusiasm with which he had thrown himself into his profession was well known. As to his extreme simplicity, he was ever ready to communicate to others from his large stores of knowledge. There was no reticence whatever about him. These were qualities which in conjunction with his great ability, deserved public and honourable recognition.

Mr. Walter Cocks seconded the motion, and expressed the hope that the result of the appeal would be to raise a much larger sum than was contributed in memory of Pugin.

The Dean of Westminster, in supporting the resolution, said that various remarks and suggestions had been made in the newspapers and elsewhere on the subject of the proposed memorial, and therefore he wished to say that he did not think it would be the desire of the Chapter, nor was it his own desire, that the memorial should take the form of carrying out any of those special works in and about the Abbey which no doubt Sir Gilbert Scott himself was so anxious to see undertaken and completed. There were three such special works which he desired to see effected. One was the completion of the stained windows of the Chapter-house; another was the beginning, if not the completion, of a new cloister which should join on to the Abbey, and suffice for the interment of the illustrious dead during the next thousand years. The third special work was the completion of the restoration of the northern entrance to the Abbey, which was of old the great entrance, and might still be made an entrance worthy of the Abbey. As far as Sir Gilbert Scott's feelings were concerned, it was impossible to imagine any architectural constructions in which his memory could be more fitly enshrined than in the carrying out of these works,—and it would be enshrined in them whoever carried them out. But he (the Dean) felt that the carrying out of these three great works was essentially the business of the Government, or of the public, or of the Dean and Chapter, either jointly or collectively. The northern porches the Dean and Chapter were endeavouring to do themselves, although they would not be able to carry out Sir Gilbert Scott's wishes as completely as they should like unless they received a great deal more help from the public. The stained windows for the Chapter-house had been long promised by the Government; but there appeared to be some obstacle,—not, it was to be hoped, insuperable,—to the fulfilment of that promise. With regard to the proposed cloister, that was a work which could only be undertaken by the Government. He quite concurred with the objects set forth in the motion.

The Bishop of St. Alban's moved an amendment to the effect that the latter part of the motion, after the word "Abbey," having reference to the endowment of a professorship ["teachership" is meant], or scholarship in connexion with the Architectural Museum, be omitted, and that the following words be substituted:—"And the restoration of the three western porches of the Cathedral of St. Alban's, his last great work, and in which he expressed himself deeply interested during the last few days of his life, would be a fitting memorial of the genius and character of Sir Gilbert Scott." In support of his amendment, his lordship spoke of the importance of the work at St. Alban's, and of the interest which Sir Gilbert was known to have felt in its progress. He confessed he had no great faith in the utility of an endowed professorship or studentship in connexion with the Architectural Museum.

Mr. O. E. Coope, M.P., seconded the amendment, and in support of the previous speaker's depreciatory remarks as to the utility of endowing a teachership or scholarship, cited the case of the Gresham lectures, founded by Sir Thomas Gresham. The professorships were endowed, and the professors gave a certain number of lectures per year, but nobody went to hear them. The proposed work at St. Alban's would make the building the grandest and longest in the kingdom.

The Chairman, before putting the amendment, reminded the meeting that the Gresham lectures had failed to be of service because, while the professors were provided, the students were not obtained. In the case of the Architectural Museum there was already a large and crowded class of students and art-workmen all eager for such knowledge as could only be imparted to them by an able professor or teacher of the industrial arts connected with building. However true it might be that St. Alban's Cathedral would be the longest in the kingdom when the porches were restored as proposed by Sir Gilbert Scott, the remark had no special significance, seeing that the meeting was not met to promote a monument to the memory of the deceased Scottish giant.

The amendment was then put and negatived with but three dissentients. The original resolution, was about to be put as a substantive motion, when

The Hon. Dudley Fortescue suggested another course. It was unfortunate, he observed, that there should be any contention on the subject, and he thought the meeting then and there assembled was of hardly sufficient magnitude to decide authoritatively as to the form which the memorial should take. He begged to move as an amendment, that all words in the original resolution after the word "Abbey" be omitted,—in other words, that the resolution be limited to the carrying out of the personal memorial.

The Bishop of St. Alban's seconded the amendment.

The Chairman said that any further delay would only jeopardise the success of the movement. It had been urged as a reason why the memorial should take the shape of the completion of the porches of St. Alban's Abbey that the abbey was Sir Gilbert's "last work," and that he died wishing to see the porches completed. But it was forgotten that Sir Gilbert had died equally desirous of seeing the prosperity of the Architectural Museum insured. All that was wanted to insure its prosperity and usefulness was a comparatively small sum. Surely England could find enough money both for the Museum and for St. Alban's. Probably when the porches of St. Alban's were completed the work would be done by men who had acquired skill in their craft through the aid of the Museum.

The Dean of Lichfield expressed the hope that there would be no further delay, and that the original resolution would be carried in its entirety as proposed. Delay would be very detrimental to the objects the committee had in view. If those interested in the completion of "last works" upon which Sir Gilbert Scott was engaged were all to put in a claim to have their special works completed *in memoriam* of Sir Gilbert Scott, there would be no end to contention. The west front of Lichfield, equally with St. Alban's, was a "last work" of Sir Gilbert Scott, and was in progress at the time of his death. If justice were to be done to his memory the meeting could not do better than confine itself to the sensible, practical resolution which he had had the honour of moving.

The Archdeacon of Middlesex spoke to the same effect, and

Mr. Ash, as a workman who had derived benefit from the teaching he had received at the Museum, earnestly pleaded for the resolution in its entirety.

The amendment having been put and negatived, the original resolution was carried, with only three dissentients.

The Archdeacon of Middlesex moved that a committee be appointed to carry out the objects of the foregoing resolution.

Professor Hayter Lewis, in seconding the motion, said what was proposed to be done had his fullest commendation and support.

The motion having been carried, the meeting closed with a vote of thanks to the Chairman (proposed by the Hon. Dudley Fortescue and seconded by the Bishop of Rochester).

A Statue of the late Mr. Alderman G. L. Ashworth, a former mayor of the borough, was unveiled on Saturday, at Rochdale, by Mr. T. B. Potter, M.P., in the presence of a large assemblage of spectators. The memorial occupies a prominent position in the public park, and is the work of Messrs. W. & T. Wills, sculptors, London. The pedestal, 12 ft. high, is of Classic design, and composed of axed granite blocks, mounted on two sets of massive steps, also of granite. The statue, 8 ft. high, is carved from a single block of Sicilian marble, and its likeness to the deceased Mr. Ashworth has been pronounced by members of his family to be excellent. The total cost has been 800*l*.

ON THE PRESENT AND FUTURE WORK OF ENGINEERS IN REFERENCE TO PUBLIC HEALTH.

THIS was the title of an address, delivered by Mr. W. Donaldson, M.A., at the annual meeting of the Sanitary Institute, held on Friday, the 31st ult., but the lecturer confined himself mainly to one portion of this work, namely, the disposal of sewage. We print a portion of the paper:—

Intermittent downward filtration by irrigation over wide areas affords the only means of readily overcoming all the difficulties of sewage purification. Purification by continuous drenching of the land, generally called intermittent downward filtration, cannot be successfully carried out without the use of settling-tanks; that is, not without the necessity of piling up heaps of sewage sludge which has very little manurial value. The getting rid of this sludge must, therefore, entail a yearly loss. It is true that on many, probably on the majority of irrigation farms where utilisation and purification are combined, these tanks are used for the clarification of the sewage before it is turned on to the land, but there is, however, not the least necessity for their use. If the sewage is kept in motion, the fine sediment is deposited evenly over the surface of the land during the process of flowing, and does not leave any visible indications of its presence, if there is an adequate area of land under irrigation. It is, of course, necessary to separate all solid bodies from the sewage by means of screens, but the total of these screenings is very small. At Reading, including the deposit of heavy sand in the screening tanks, the average daily quantity does not exceed three-quarters of a cubic foot per thousand, but at Reading the duplicate system is strictly carried out, and the sanitary authority has not to deal with the road grit nuisance.

Colonel Jones has adopted these settling-tanks on the Havod-y-Wern Farm, and is now engaged experimenting on the sewage sludge with the hopes of making it saleable at a profit. He may possibly find a profitable market for the small quantity deposited in the tanks at Wrexham, but his success will only be partial. Until manure made from sludge can be sold at a price which will admit of carriage to a long distance, the use of settling-tanks must entail a yearly loss.

In my opinion, the want of success on irrigation farms has been in no inconsiderable degree owing to the half-hearted way in which the advocates of utilisation have taken up the question. They ought to have regarded purification as quite a secondary consideration, because utilisation must necessarily accomplish successful purification. The problem which they have hitherto attempted to solve has still been, how few acres will effectually purify the sewage of 1,000 people? The exact converse ought to have engaged the whole of their attention, how many acres will the sewage of 1,000 people effectually fertilise. The nuisances occasionally experienced on sewage farms, which are the main cause of the difficulty of acquiring land, need never occur except in those cases in which the minimum standard of acreage requisite for purification has been adopted.

Sir Joseph Bazalgette at the discussion by the Sanitary Institute in March, 1877, upon the mode of treating town sewage, arguing from the example of London, came to the conclusion that it would not be possible to obtain land in the neighbourhood of large towns in sufficient quantity and suitable quality and free from residences, for the purpose of sewage farming. He comes to this conclusion because London with a population of 4,000,000 would require an area of sixty square miles, which, expressed in another way, is an area less than eight miles square. London is, however, about ten times larger than any other town in the kingdom, so that arguments against the adoption of irrigation derived from the example of London, even if well founded, are not applicable to any other case. In my opinion, however, the argument is not in any other respect well founded. Surely in a food-importing country like England, the more acres the sewage manure will not only fertilise, but render at least doubly more productive than they can be made by any other manure, the better for the people. It is not necessary that the area required for irrigation should be either in the immediate neighbourhood of the town from which the sewage has been sent, or free from residences. If a sufficient area is used, no nuisance will be occasioned, and sentimental

fears on that head can easily be allayed by interposing a belt of unirrigated land.

If the Town Council of Manchester can bring water from Thirlmere to Lancashire and sell it at a profit, it is clear that sewage may be conveyed to an equal distance and also sold at a profit if its commercial value is equal to that of the water. For the purpose of comparing the values of the two commodities we must not adopt as the standard of the value of the water the price at which it is sold after having been distributed throughout the district to each set of premises, but what it is worth in the service reservoirs. In order to ascertain its value in the service reservoirs we must deduct the cost of distribution, which includes nearly all the cost of management and maintenance, not from the price at which it is sold for household purposes, but from that at which it is sold in large quantities for commercial purposes, because Waterworks Companies do not sell any water at a loss. Taking all these points into consideration we cannot assign a higher value than 2d. per thousand gallons to the water in the service reservoirs previously to distribution.

In the Reports of the Rivers Pollution Commissioners the manurial value of sewage is said to vary from a maximum of 2d. per ton in dry weather to a minimum of ¼d. when the sewage is diluted with storm water. According to these estimates the value of crude sewage varies from 2¼d. to 9d. per thousand gallons.

I am well aware that you will not regard the theoretical estimates of analytical chemists as evidence of much value in support of my views as to the actual value of dry weather sewage, because it is the general opinion that this value can never be realised. I shall therefore endeavour to show you that this view of the question is erroneous, that in reality the smallest value is in all cases actually realised by the production of magnificent crops, and that the failure takes place in the next stage. The full value of the crops is not realised. Irrigation farms in the hands of practical farmers who understand the art of making the most of the farm produce cannot fail to pay handsome returns in hard cash, but practical farmers keep their balance-sheets to themselves.

On the basis that the sewage of 100 people can properly fertilise only one acre, and at the rate of 20 gallons per head of sewage, which is a high estimate where the separate system is in force, one acre will require annually 730,000 gallons. We have now to consider what that acre of land under sewage irrigation is capable of producing. One acre sown with rye grass will produce five or six crops a year,—fully 60 tons of grass. This is sold at prices varying from 10s. to 20s. according to the demand and the locality of the farm. Estimated at only 10s. per ton the gross return would be about 30*l.* per acre. From corn and root crops the gross return is worth from 20*l.* to 30*l.* per acre. Against this amount is to be debited rent, taxes, working expenses, and interest on farm capital. If the land is let at an ordinary agricultural rent, 12*l.* a year ought to cover all the yearly charges under these heads, and a balance of from 12*l.* to 14*l.* per acre would be left to divide into tenant's profits and payment for the sewage as a manure. If this be divided equally between them the amount paid for the sewage would be over 2d. per thousand gallons. If 3*l.* a year per acre in addition to interest on sunk capital be considered a fair tenant's profit, the value of the sewage would on that basis be more than 3d. per thousand gallons.

In Colonel Jones's pamphlet on the Havod-y-Wern Farm it is stated that the average net profit for five successive years amounted to 3*l.* 4s. 4d. per acre. The rent paid by Colonel Jones is nearly 5*l.* per acre, so that the rates and taxes must be proportionately heavy. As he is only tenant, he puts on the debit side a yearly sinking-fund, to recoup himself for capital sunk in permanent improvements, which amounts to about 7s. per acre; with this addition the total net profit made by Colonel Jones is about 3*l.* 11s. per acre. This, however, represents only part of the whole profit. The cows fed on the farm are owned and kept by another man, who is presumed to live on his profits, but publishes no accounts. There are only 92 acres, so that the profit made by the cow-keeper cannot well be less than 30s. an acre. If the rent paid by Colonel Jones had been an ordinary agricultural rent, his profits would have been increased by a deduction of fully 3*l.* 10s. from the debit side in the amount charged for rents, rates, and taxes. Making these allowances, the total net profit made on the Havod-y-Wern Farm has been, on an average of five years, fully 8*l.* per acre.

The successful disposal of sewage crops is at the very root of the whole matter. To state that there is a difficulty in finding a market for them in some cases is tantamount to saying that there is no home demand for milk, butter, cheese, and beef. The produce must be consumed on the farm and converted into food for man before it is brought into the market. This work can only be successfully carried out by private enterprise. So far, therefore, as the interest of Sanitary Authorities are concerned, the only point to be considered is the question of the rent at which they will be able to let irrigated land.

NATIONAL WATER SUPPLY.

WE supplement our reports* of the recent Congress on Water Supply at the Society of Arts, by giving summaries of papers submitted for consideration, though not formally read or discussed.

Mr. William Bennett, member of the Liverpool Water Committee, submitted a paper in which he said:—

"I look upon it as the compulsory duty of all Corporations or private companies, who obtain Acts of Parliament for the supply of towns, 'to supply pure water to the population' irrespective of trade peculiarities. I consider that it is a duty the manufacturing and trading community owe to themselves to develop the great natural resources of the kingdom, so as to adapt them to the varying specialities and wants of districts; for, as Mr. Bateman says in his evidence, Manchester wants a different water from Liverpool; and I recommend that all large towns, such as Liverpool, which has water from a large river at command, should encourage the formation of a private company for the supply of water under high pressure to be used as a motive power, the company agreeing, for the privilege of laying their pipes, to supply gratuitously at any required pressure such mains for the suppression of fires, as may be laid down by the authorities. By this course the inhabitants of large towns secure a good and wholesome water for domestic use, the manufacturers obtain the best kind of water for their 'varying specialities,' and by the supplying of water at a high pressure, from a costless source, a motive power can be introduced into all kinds of works and offices free from the risks of fire, or explosions, and the nuisance of smoke, and in addition salt-water baths can be supplied, and fire mains kept constantly charged, and instantly adjusted to the exact pressure best suited to the site. Liverpool is now supplied from public and private wells with more than twenty-one millions of gallons of spring water daily; by deeper boring, this quantity may be materially increased, and, by using water obtained solely from deep borings, the quality will be in all respects 'unobjectionable for domestic use,' as stated by Dr. J. Campbell Brown, the analyst employed by the Liverpool Corporation. A boring is now being made at Liverpool 26 in. in diameter, and 1,000 ft. deep, in the expectation of adding to our supply ten million gallons per week. A few similar bore-holes made in the immediate neighbourhood, it is thought, will supply pure water for domestic purposes for the next century."

Mr. J. W. Willis Bund contributed a short paper, in which he said:—

"1. A large and comprehensive scheme of a national character with regard to the water supply of the country is practicable if a proper body is appointed to watch over it, and money provided to carry it out.

2. The country is by nature divided into a number of watersheds, and it was obviously intended that the supply of water, given by nature to each of those watersheds, should suffice for it.

3. Any really national scheme must, therefore, be based upon the principle that each watershed has *primâ facie* a sufficient supply of water for its wants.

4. If it is not so, the deficiency must arise from two causes: (*a*) the natural character of the district has been artificially altered; (*b*) the natural sources of supply are not available.

5. As to (*a*), this may arise from the increase of the inhabitants, or the introduction of manufactures, and on its being shown that the supply was insufficient from these causes, then the district might be allowed to obtain a supply from another district where there was a greater supply taken for the existing and probable wants of that district required.

6. As to (*b*), this must arise from some act of the inhabitants of the district; every means should therefore be taken to render such supply available, and, until it was clearly proved that all such means had been used and exhausted, no district should be allowed to resort to another for its water supply.

7. An account should be taken of the water supply of each district, showing what is, and what is not, available, and if the supply of any is deficient, steps should be at once taken to utilise the existing source at present unavailable.

8. When that was done, if the supply was still inadequate, application might be made to some central authority asking leave to take water from another district.

9. Before the leave was granted, the applicants should prove to the satisfaction of the central authority (1) that they had utilised all their available sources of water, (2) that the supply of water to the district from which they proposed to take it was more than ample for any reasonable increase of population for a long period of years, (3) that all the districts through which the works abstracting the water passed should have on payment a right to be supplied, either at the present or at a future date.

10. No scheme to take water from another district should be submitted to Parliament that did not comply with the requirements of the last section."

Sir Henry Cole contributed a short paper in which he asked for consent to the following propositions:—

"1. That as the law already forbids poisoning the people by bad air, it should be admitted that every one has a right of obtaining pure water in sufficient quantity for his daily life as far as practicable.

2. That water fit for dietetic purposes can only be supplied after proper filtration; consequently no river water, except at the very source of it, is pure enough, and well-waters generally are rarely sufficiently pure for drinking purposes. The Duke of Somerset recently declared the use of rivers for drinking must be given up. As a general rule, the sparkling gaseous waters pumped up from the metropolitan wells and wells generally are dangerous to health. Throughout Birmingham the well-water is more or less poisonous, and unfit for drinking. The water in wells in cottage gardens is generally tainted by drains, and the water of ponds ought not to be used even for cattle.

3. That pure water will increase the health and vigour of the people, and provide the best antidote to intemperance."

Sir Henry went on to say, that it appeared to him that,—

"The plans now being discussed by London, Liverpool, and lately settled for Manchester, suggest the practicability of an extended action under national sanction.

That great districts should be bound to look after the supply of water, with regard to the neighbouring small towns and still smaller villages.

That the spirited example set by Manchester, of supplying a limited district, be accepted as wise and beneficial, and that the principle be applied to the whole kingdom, to be mapped and parcelled out into a sort of water heptarchy, with federative powers.

And that for reasons of economy and excellence of supply, the nation, through Parliament, should cause all great reservoirs to be provided for supplying the proper quantity of pure water, leaving towns and villages to construct all the local arteries. * * * * *

The scientific application of known facts, with the present amount of knowledge, would not appear to be difficult, so as to cause an adequate number of reservoirs, for the whole of the United Kingdom, to be provided. England and Wales might be divided into seven districts, and under a local Commission. Let each district be confided to a competent well-known engineer, to prepare the plans necessary for it, and let these form a united Board for the discussion of general questions. I am informed, by one who has made the subject of water supply his study, that a year would be ample time to devise a general national scheme.

The general financial principles to govern the scheme should be the work of the Government. The capital required might be a hundred millions of pounds or more, but what is that, looking to the cost of railways, not quite so important as pure water?"

Mr. J. Bailey Denton's paper contained the following passages:—

"As it is the wish of H.R.H. the Prince of Wales to ascertain 'how far the great resources of the kingdom might, by some large and comprehensive scheme of a national character adapted to the various specialities and wants of districts, be turned to account for the advantage of the general body of the nation at large,' I desire to express my conviction that if by the term 'large and comprehensive scheme of a national character,' it is suggested that one scheme of works or one mode of supply can be devised which shall be applicable to the whole country, I am not of opinion that such an object is practicable. The great difference that exists in the rainfall as a source of supply, the diversity of surface, the variety of soil upon which the rain falls, and the irregular denseness or sparseness of population in proportion to space, forbid the realisation of such an idea.

I am, nevertheless, perfectly convinced that if there existed (1) a proper conservancy of rivers extending over the whole area of their basins, (2) an exact knowledge of the hydro-geological conditions of each river basin, and (3) legal facilities for dealing with the water rising up within, and flowing through, and existing under private properties, there would not be a single village in the country but might be abundantly supplied with pure water.

To render river conservancies competent to exercise that control over river systems which would preserve riparian and private rights, while securing to the public the enjoyment of the chief element of health,—pure water,—the first step to be taken should be the collection of all existing information bearing upon the surface and subterranean waters within each river basin, prepared on such a form as to be immediately available and capable of enlargement as fresh information may be obtained. At present there is no reliable record of such data within the reach of either local authorities or engineers, although a mass of information exists in a scattered and very costly form, in the Ordnance and Geological Survey Departments, which might afford data whereby neglected springs and subterranean waters might be turned to account. Were this information obtainable in an authoritative shape, the indisposition of the owners of landed estates to place at the service of sanitary authorities the sources of supply which they possess by territorial right would cease to operate as injuriously as it now does.

Numberless examples of what may be done in the way of water economy, by the use of wheels, turbines, rams, and pumps, and in the way of storage, for village supply, are to be found scattered over the whole face of the country. If these instances, instead of being disregarded, or only cursorily mentioned in Parliamentary Committees, were carefully examined and described in a popular, but practical form, the serious want of water experienced in villages and rural districts, which induced H.R.H. the Prince of Wales to come to their rescue, would vanish in a great majority of cases, though, so long as permissive laws stand in the place of compulsory laws in a matter of such vital consequence to every one as pure water, and boards of guardians are the judges of the time and course of action, so long will the present state of things exist."

Professor Frankland, in a short paper, said:—

"Although I cannot see how a comprehensive scheme of water supply of a national character could be carried out without both waste of capital and interference with manufacturers, I consider that the adoption of a few general principles in legislation would be of great advantage in procuring a fair distribution of water, and preventing needless waste. Thus:—(*a*) The withholding of permission from towns, &c., to go to a great distance for water until both the before-mentioned sources of wholesome water have been exhausted. (*b*) Where a distant source is allowed, the securing of a necessary provision for intermediate towns, villages, and hamlets. (*c*) In large towns,

* See pp. 534, 568, *ante*.

the separate supply of water for manufacturers, street waterings, and outdoor purposes generally. (*d*) The sale of domestic water by meter to all houses above a certain rent.

The waste of domestic water is a crying evil, which can only be efficiently remedied by the compulsory use of meters. In Glasgow, 38 gallons per head are used for domestic purposes; in London, 26 gallons; and in Malvern, where the meter system is in use, 7½ gallons per head. Ten gallons daily per head is amply sufficient for domestic purposes, and would probably never be reached if the water were sold by meter.

By separating the indoor from the outdoor supply, and selling the former by measure, the quantity of wholesome water required would be reduced to one-third or less, and there would be no risk of unwholesome water being used for dietetic purposes through carelessness or mistake."

Mr. Joseph Parry, C.E., of Liverpool, contributed a paper, in which he made the following suggestions and recommendations:—

"1. To divide the country into water-shed districts.

2. To appoint an engineer to each of the principal water-sheds, whose duty it shall be to deal with all matters relating to water supply, the pollution and appropriation of rivers, streams, springs, and underground waters.

There are twenty-five watersheds exceeding 500 square miles in area. These, with smaller sheds added, might be distributed in the manner I propose among fifteen or twenty engineers. Several engineers are at present engaged in the protection of public interests in rivers under Conservancy Boards, Commissioners, Fishery Boards, and other bodies. As far as practicable, all such interests, often conflicting, should be placed under the one engineer.

(*a.*) The salaries of the proposed engineers to be paid either entirely by Government or partly by Government and partly by contributions from the several sanitary authorities and other public bodies interested in the work done, and no further charge to be made for services rendered or plans prepared.

(*b.*) The engineers to advise sanitary authorities on all questions affecting the water supply and disposal of sewage; but restrictions to be placed on the preparation of plans for authorities employing their own engineers, or for places exceeding a given population. To take no part in the ordinary management of waterworks.

(*c.*) To report to the local sanitary authorities any impurity or deficiency; and in certain districts to be specified to prepare plans and estimates for works required.

(*d.*) Failing action on the part of the sanitary authorities, the circumstances to be reported to the Local Government Board.

In many cases it would be sufficient to call attention to the polluted state of a supply, and explain the means by which the evil could be remedied, to insure prompt action by the inhabitants or authorities concerned. In other cases, and perhaps in numerous cases, it might be necessary to exercise compulsion. And, having regard to the interests involved, there should be no hesitation in arming the Local Government Board with compulsory powers to deal with such cases, within reasonable limits as to cost.

(*e.*) The engineers to report annually to the Local Government Board; also to report on all Waterworks Bills promoted within their districts.

A system such as is thus briefly sketched would form a link which is now wanting between the Government and the country; would give to the people, through their local sanitary authorities, the practical advice and assistance the want of which is often the only cause of failure to remedy the evils from which the people suffer; would spur indolent, interested, and careless authorities into useful activity; would strengthen weak authorities in proceedings against powerful landowners and manufacturers; would diminish greatly the expense and the risks of private Bill legislation; would afford means of enforcing the provisions of the Act for preventing the pollution of rivers; would diminish the present costly conflict of selfish interests; and would secure for the use, enjoyment, and benefit of the people generally the natural resources of the country."

THE PROTECTION OF IRON SURFACES FROM OXIDATION OR RUSTING.

WITH reference to the notice in our last issue of Mr. Bower's process, Mr. Tweedie wishes it understood that, as a matter of fact, to Mr. Bower alone must the honour of discovery be assigned, as he, Mr. Tweedie, has merely acted as the chemist in his employ, and his experiments have been simply the working out of Mr. Bower's ideas.

What we said in our last having, naturally, excited interest, some fuller particulars will doubtless be welcomed. The history of the discovery is interesting. Mr. Bower having, in some experiments he had conducted, about ten years ago, for the production of non-illuminating gases (one of them being the production of hydrogen by passing steam over red-hot iron), observed the fact of steam having the power to alter the surface of the iron. Want of leisure prevented him from following up this observation until Barff's process was brought into notice, when his early experiment recurred to him, as well as the idea that the oxygen, as it exists in our atmosphere, would serve the same purpose as well as, or better than, the oxygen as it exists in water or steam. A few experiments were at once performed, and proved this supposition to be a correct one.

Mr. Bower having thus elicited the fact that air would effectually coat the iron with the much-desired film of magnetic oxide, at once commenced an elaborate series of experiments to ascertain the exact conditions of success, and although many of the experiments proved far from encouraging, yet by indomitable perseverance, and at a great expense, the efforts of that gentleman have been at last crowned with success.

The following experiment merits, from the extraordinary result, some attention. Mr. Bower had the idea that the hot blast, as used for the production of pig-iron, would not only heat the iron to the requisite temperature, but would also supply the oxygen for the production of the magnetic oxide; and by the courtesy of Messrs. Cochrane & Co., of Dudley, he was enabled, many months ago, to try the experiment. A square bar of cast-iron was exposed to the action of the hot air for about twelve hours, when the bar was withdrawn, and found to be firmly and thoroughly coated with the magnetic oxide. This coating has protected the iron perfectly from the oxidising action of moist air, although subjected to the most trying tests, and at the present time the coating is as firm and homogeneous as when first withdrawn from the blast, the iron having rusted only where the oxide has been purposely removed, and even there not the slightest trace of lateral rusting is to be detected.

It will be advantageous here to give the composition and mode of formation of the various oxides of iron to enable us to understand clearly the *raison d'être* of the process. When iron is first exposed to the action of moist air, it abstracts one atom of oxygen, and forms the protoxide of iron or ferrous oxide FeO; such an oxide has an intense affinity for more oxygen, and becomes speedily converted into sesquioxide of oxide or ferric oxide Fe_2O_3; this oxide, better known as rust, in contact with metallic iron, again becomes converted into ferrous oxide, according to the equation

$$Fe_2O_3 + Fe = 3\,FeO$$

This ferrous oxide being again brought into contact with a fresh supply of oxygen, is reconverted into ferric oxide or rust, and so the action goes on continually in this way disintegrating the iron.

If iron be, however, exposed to the action of steam or air at an elevated temperature, instead of the above oxides we get a curious oxide formed known as magnetic oxide of iron, and also by many chemists as ferroso-ferric oxide, its formula being Fe_3O_4, making it apparently a compound of ferrous Fe O and ferric-oxides Fe_2O_3. The exact molecular arrangement of this interesting body must still be regarded as a debateable point; one thing, however, is certain, and that is, that this magnetic oxide is not susceptible of change or conversion into rust by the action either of oxygen or moisture under ordinary conditions.

It is obvious, then, that this magnetic oxide offers itself as a specially good material for coating iron articles requiring protection from rust, and if we can get it on the iron as a firm, hard, coherent coating, we have solved an important problem, and have given to the world the best possible means of protecting iron, and thus incidentally vastly extending the applications of that useful metal.

This has been done, as already mentioned, by Professor Barff, by the action of superheated steam, the details of which process are sufficiently well known, and also by the process of Mr. George Bower, to which this article draws particular attention, as the application of air itself at a suitable temperature must possess advantages over the use of superheated steam, both as regards economy and the ease with which it may be applied.

The method hitherto adopted in the working of the air process has been simply to expose the iron articles in a large retort or chamber, the temperature of which is raised to a point dependent on the ultimate use to which the articles may be applied, and which ranges from a very dull to a bright red-heat. Air is then passed in, and the inlet and outlet pipes closed as perfectly as possible, and at the end of every hour the air is renewed and the inlet again closed. After exposure in this way for some hours, the time varying with the nature of the articles, the iron will be found to have received a perfect coating of magnetic oxide, the colour of which varies between a light and a dark grey, or neutral tint of so delicate a nature as to absolutely dispense in many cases with the use of further ornamentation by painting, &c.

The coating has been subjected to the severest tests, and has invariably resisted all attacks of both air and moisture, and there is thus every reason to believe that this process will, when completely developed, entirely supplant every other method of protecting iron from rust.

The cost of coating iron in this way is estimated at about 1*l.* per ton of iron; but there is this peculiarity appertaining to the process, that whether the ton of iron be a solid cube or mass of that weight, or whether it be distributed over thousands of articles, involving an enormous increase of area, the cost remains practically the same.

THE ALTERATIONS TO THE INSTITUTE PREMISES.

WE have been rather pressed to give an opinion on the scheme for altering the premises in Conduit-street, so as to afford more accommodation for the increased requirements of the Institute. Under these circumstances we may be excused for giving the opinion, which, perhaps, we should hardly have volunteered otherwise, that the plan as it stands is a mistake, and will not do. Sketch-plans are in the hands of all the members of the Institute; plans, we may observe, with no scale attached to them, a rather odd omission in drawings made by an architect for architects; but the principal dimensions of the rooms are figured, and, therefore, the general arrangement can be judged of on reference to these plans. Considerable ingenuity is shown in the arrangement of the rooms, so as to make the most of the space, but we believe most members who take the trouble to examine the plans will agree with us in thinking that the placing of the meeting-hall on the upper (second) floor of the building is a mistake, which ought to be fatal to the scheme. It is all very well to say that the hall is only used for the fortnightly meetings, and that, therefore, a climb to it is of less consequence; but the meetings are the main objects of the whole building, and the meeting-room should be on the principal floor. There is another practical objection to this feature in the scheme. The meeting-room is exactly the one in which light is of least consequence, as it is hardly ever used except at night; on the other hand, the reading-room is the place where light is most wanted, and it will be most inadequately supplied by the window shown at one end of a long room; in fact, except on very bright days, half the reading-room, as shown, would be practically useless. The library, also, is just the room in which a top-light is most wanted, in order to leave the walls clear for bookshelves. The present library is nearly full, and the three windows take up a great deal of wall-space which might be utilised for this purpose. It therefore seems to us only a matter of common sense that the library and reading-room should be on the upper floor, where they will have the top light, even leaving out the question of the undoubted propriety, architecturally speaking, of placing the principal room on the principal floor.

There are other criticisms to which the plans appear to us to be open, but we will not say any more now; the scheme will, we believe, be discussed at a special meeting of the Institute, and perhaps something will be struck out which will satisfy all demands. But we are distinctly of opinion that any satisfactory scheme must include retaining the meeting-room on the main floor. There is one other point that the drawings suggest, which we should not like to pass over. It may be hardly fair to take mere sketches as any basis for judging of architectural design; still, we observe that the meeting-hall is represented as decorated with pilasters, panels, and festoons or garlands from one pilaster to another. We do not wish to speak disrespectfully of such orthodox and well-worn architectural garniture, but, on the whole, is not this rather too hackneyed? And if the central body of architects are designing a room for themselves which will be taken by outsiders as an example of their own artistic taste and predilections, had they not better either invent something that will be admired as artistic and original, or else leave decoration alone altogether?

We should have been glad to give our support to any plan by Mr. Phipps, whose abilities and success as a theatre architect are too well known to need commendation from us; but, having been asked for an opinion, we are led to confess that we cannot regard the plan circulated to members as very successful, or as likely to give permanent satisfaction if carried out; though it must, of course, be admitted that the problem of getting the accommodation into the space required, with due regard to cost and to the interests of others in the building, is not an easy one.

EXTENSION OF THE KENSINGTON INFIRMARY.

AT the last meeting of the Kensington guardians the Infirmary Committee reported that it was desirable to purchase the whole of the piece of ground adjoining the workhouse, on which the infirmary of St. Margaret's and St. John's stood, which would shortly be in the market. This would provide for a needed enlargement of the infirmary of the Kensington Board, and also for the establishment of a vaccination station. The committee, therefore, recommended that application be made to the Local Government Board to authorise the guardians to treat for the purchase. Mr. Brandreth opposed the purchase on the ground of expense, and said the guardians should not give way to a building mania. Mr. Cockerton said there was such a demand for space in the infirmary that patients had to be hurried through into the workhouse before they were fit for it. Adverting to Mr. Brandreth's remarks, Mr. Murlis observed that he was also opposed to a building mania; but this piece of ground was valuable to the guardians, and should be purchased while there was the opportunity. The recommendation of the committee to purchase the ground was adopted.

THE NEW UNIVERSITY OF LEYDEN.

IN the international competition, as regards the plans and drawings for the proposed new university buildings at Leyden, the names of three of the architects who had won premiums were, owing to some accident, missing, and they were accordingly advertised for in some of the chief Continental papers. The winner of the first premium, with the motto, "Vivat Academia," is Professor L. Bohnstedt, of Gotha, who may be remembered as having carried off the first prize in the competition for the new Houses of the German Imperial Parliament. The second premium was taken by Messrs. Tarring & Wilkinson, of London; the third by Messrs. E. & W. Mengelberg, of Utrecht; the fourth by O. Sptetzler, of Boehum; and the fifth by Messrs. Brekelbann & Wiegand, of Hamburg.

CONGRESS ON NATIONAL WATER SUPPLY.

SIR,—In your valuable journal of Saturday last, it was stated by Professor Frankland, at the second day's sitting of the Conference, that the experiment of water-supply by meter had been tried in Great Malvern, and it was found that seven gallons and a half per day for each person sufficed. In furtherance of the above statement, allow me, sir, to add that the system of water supply by meter for sanitary and domestic purposes has been in operation here over six years, and that it has fully answered the purpose intended, viz., the prevention of waste; and further, that from eight to nine gallons per day for each person are ample.

From experience, I have no hesitation in saying that the above system can be carried out in any town with similar results.

JOHN E. PALMER, Town Surveyor.

Great Malvern.

P.S.—Great Malvern is, I believe, the only town in England which supplies its inhabitants by meter for sanitary and domestic purposes.

PROCRASTINATING BOARDS.

SIR,—Can any of your numerous correspondents recommend a cure for the lethargy that has so long been inherent, and rendered every effort of the Littlehampton Local Board of Health of no avail for good, either now or hereafter? The Board has taken more than twenty years to make up their minds whether to have drainage or continue the good old system of cesspools in juxtaposition with the wells. The Duke of Norfolk has very liberally offered to bear one-half of the expense of a thorough system of drainage, providing the Board will enter into a bond to commence the work forthwith, and have it done under proper superintendence, but the Board decline to enter into any such bond, and wish for another twenty years to consider such "a very serious matter." I have just met some of the Board, who are crowing over having passed, they say, such a resolution. The talents of some Boards are said to be under a bushel; I am certain that the talents of the Littlehampton Board cannot be above a bushel, but considerably under.

A VISITOR.

Baths and Washhouses for Chelsea.—At the last meeting of the Chelsea Board of Guardians, it was resolved to establish public baths and washhouses for the parish. A site is in view.

THEATRES AND MUSIC-HALLS.

Elephant and Castle Theatre, New Kent-road.—This theatre is to be rebuilt, and with better exits and entrances. It will have two circles above the pit, namely, the dress-circle and gallery, besides private boxes. Each portion of the house is to have not less than three exits and some more. The contract has been let to Messrs. W. Bracher & Son, builders, of Great Ormond-street, Queen-square; Messrs. Pashley, Newton, & Young, of Red Lion-square, decorators; and Messrs. Z. D. Berry & Sons, of Regency-street, Westminster, gasfitters. Mr. J. T. Robinson, of Bloomsbury-square, is the architect.

The London Pavilion, Tichborne-street.—A few months ago six architects were invited to send in plans for the alterations of the above hall. On Thursday, in last week, Mr. Loibl, the proprietor, invited all who had sent in plans to dine with him. The letters then were opened, and cheques were given to the three successful architects. The first premium was given to the motto of "*Bonâ Fide*," Mr. J. T. Robinson; the second, to the plans bearing the motto "Pavilion," Mr. Flack, of London; and the third, to the plans under the motto "Boaz," found to be by Messrs. Wilson & Willcox, of Bath.

ART-UNION OF LONDON.

THE following are the chief works chosen up to this date by prizeholders:—

From the Royal Academy.—"Little Záarah," J. Sant, R.A., 155*l.*; "A Primrose Morning," J. Clayton Adams, 100*l.*; "Folklore," C. Gregory, 100*l.*; "A Moorland Stream," W. S. Morrish, 80*l.*; "Sunny Hours," D. W. Wynfield, 80*l.*; "The Crab," E. Hume, 78*l.* 15*s.*; "A Day-dream," W. Dendy Sadler, 63*l.*; "The Wanton Troopers," Marcella Walker, 50*l.*; "The Heir come of Age," R. Redgrave, R.A., 50*l.*; "The Mill-head," Alfred Parsons, 42*l.*; "Mother and Child," Mr. Sparkes, 42*l.*; "A Corner of the Forest, Inverary," Georgina M. Greenlees, 40*l.*; "Place Fell, Ulleswater," Alfred Powell, 36*l.* 15*s.*; "Kept In," W. H. Weatherhead, 35*l.*; "A Competitive Examination," Kate Perugini, 35*l.*; "The Woods in Spring," C. Gibbs, 25*l.*; "From a Sketch in the Simplon Pass," G. H. Browne, 20*l.*

From the Society of British Artists.—"The Legend of the Poignard," J. C. Waite, 80*l.*; "Suk al Ghûrûjeh, Cairo," R. M. Chevalier, 60*l.*; "On the Conway, near Llanwrst," A. B. Collier, 50*l.*; "A Country Forge," J. M. Barber, 50*l.*; "On the Thames, Cookham," D. Law, 45*l.*; "A Welsh Homestead, near Beddgebert," W. H. W. Foster, 45*l.*; "A Sunny Afternoon, Surrey," A. Powell, 42*l.*; "The Twelfth of August on the Moors," E. R. Breach, 40*l.*; "La Belle Fleuriste," A. F. Patten, 31*l.* 10*s.*; "Between the Showers," R. Crafton, 30*l.*; "The Bird Rock, near Towyn, North Wales," B. Evans, 30*l.*; "Durham," A. A. Glendinning, 30*l.*; "The Pride of the Port," A. C. Stannus, 67*l.*; "A Visit to the Antiquarian," G. Van de Bos," 55*l.*; "Landscape and Cattle," Miss L. Von Perbandt, 40*l.*; "Sunny Days," J. C. Waite, 35*l.*; "Stepping-stones, Bettws-y-Coed," F. Turner, 30*l.*; "The Day's Decline," T. S. Croxford, 30*l.*; "A Shepherdess," J. M. Bowkett, 25*l.*; "Near Tintagel," T. S. Croxford, 25*l.*

From the Royal Scottish Academy.—"By the Burnside," Inverarnan," Alexander Fraser, R.S.A., 80*l.*; "Old Boatyard," P. S. Nisbet, 50*l.*; "On the Thames," Dr. Law, 36*l.* 15*s.*; "The Heart of the Trossachs," Jas. Hamilton, 25*l.*

From the Society of Painters in Water-Colours.—"Moonlight—Vessels running for Swansea Harbour," Edward Duncan, 60*l.*; "Mussel Gatherers, Conway Marsh," H. C. Whaite, 45*l.*; "Derwentwater," Charles Davidson, 43*l.* 10*s.*; "Chatillon, Val d'Aosta, on a Misty Morning," Collingwood Smith, 35*l.*; "View of Bamborough Castle, Wreck Ashore," Jno. Callow, 21*l.*

From the Institute of Painters in Water-Colours.—"Garden Spoil," G. G. Kilburne, 70*l.*; "Waiting for the Ferry-boat," J. H. Mole, 63*l.*

From the General Exhibition of Water-Colour Drawings. "The Cottage by the Brook," Arthur Shelly, 25*l.*

THE IDEAL SANITARY INSPECTOR.

IN a good lecture on "Sanitary Reform," delivered at Alva some little time ago, and just now published, Mr. Kenneth M. Macleod says,—"As the Sanitary Inspector is an official of recent growth, I shall, before giving an account of his special work, give you a description of the qualifications he should possess to fit him for his important but dangerous work. He should be the owner of a good sound constitution, he should have sufficient sense and self-denial to follow the rules laid down by competent authority to preserve it so, including temperance and strict regularity, to repel, as far as possible, an attack on himself of the infectious diseases he is daily coming in contact with. He should have a pleasing address, and be as much as possible calm and collected. He must be conversant with the proper principles of house construction, ventilation, and drainage, with the best modes of carrying out the same according to the circumstances of individual places. He should have a knowledge of all kinds of traps, water-closets, and all their fixings; be able at a glance to detect a structural defect preventing the admission of light or ventilation, and in an intelligible form point out a remedy; and, if need be, draw a neat little pencil sketch of the defect for consideration of the owner or occupant who is to be asked to make the alteration. He must have an observant eye, a quick ear, and a sensitive nose. In meeting with owners and occupants he should be more forward to hear than to speak. In no public duty more than his, is Carlyle's favourite maxim more applicable that 'silence is golden.' When speech is necessary he should confine himself to the matter in hand, explaining only what needs to be explained, and persuading where persuasion is likely to be of use; to see, to hear, to smell, to note, and to report—that sums up his work as an Inspector. In doing this work he will have to restrain his temper, practise patience, and learn to endure hard speeches without answering back. He must, by observation, educate himself to detect at a glance the kind of infectious disease with which any patient he may discover, or be sent to, is affected; and, in such cases, be ever ready with a kind word to cheer up patients and their desponding friends. He should bear himself with a sympathetic aspect to the many bereaved ones,—widows, mothers, and orphan children,—he will so frequently meet with in the performance of his duties; kindness must characterise his every movement on epidemic duty, and rude behaviour or supercilious officialism should find no place in his conduct. He should acquire a knowledge of the different kinds of disinfectants, and know those best fitted for safely and effectually disinfecting fever localities, and the changes scientific authorities assert they effect on the atmosphere or article operated upon, and be able to explain the same if asked by any doubting delinquent who refuses to apply them. It is hardly needful to add that, in addition to all these qualifications, he must be of a courageous spirit, have no fear of infection, and be ever ready to join an attack on infected strongholds."

CROXTED LANE.

SIR,—This favourite lane being the property of Dulwich College, possibly the governors may feel bound to obtain the utmost present return in ground-rents. Therefore, if desired to preserve it for recreation, the loss of revenue has to be considered. The governors, however, have evinced a decided care for the trees on the estate, and the leaseholders are bound by covenant to preserve them. But should this ground be condemned to the fate which has overtaken many other beautiful spots, and be devoted to building, there is one important point not to be forgotten in setting out the plans, and it is this,—the backs of the houses should not be exposed to the view of passengers by the adjacent railway. Only take a ride on it from Clapham to Herne-hill, see how close the houses are built to its banks, observe the exposure of bedrooms, kitchens, closets, back courts, &c., all in a row, with their varied accompaniments of household work, washing, and other details, interesting enough in domestic life, but inappropriate for public exposition, and appearing to compete for the credit of turning private affairs inside out; and then say whether decency and comfort are possible in such dwellings. We hear and read much of improved habitations, yet here behold a deliberate abandonment of propriety and privacy, destructive of respect for home. This railway was laid out through a pleasant open stretch of country, green pasture varied by gardens and villas, but all that has disappeared, and at present the view from the windows of the railway carriages is a panorama of disagreeables, often disgusting. Let us hope that by enlightened management Croxted-lane may not be made to increase the evil. H. C.

THE PRESERVATION OF IRON.

SIR,—Mr. Tweedie has expressed to me his concern that by some error you have associated his name with the development of my air process of preserving iron from rust. Will you kindly allow me to say that the discovery was not the result of accident, but of long experiment?

The *accident* incident, to which your notice of my process refers, was due probably to a letter I wrote in March, of last year, when Professor Barff's discovery was first announced at the Society of Arts, stating that but for the accident of my having some ten years ago used some old iron in an experiment I was then making instead of new, I should doubtlessly have forestalled the Professor.

Mr. Tweedie has been of great service to me in conducting some recent experiments; but the specification of my patent was published before I had even the pleasure of his acquaintance.

JOHN BOWIE.

DUBLIN (SOUTH) CITY MARKETS COMPANY'S COMPETITION.

THE directors of the above company instituted a limited competition for the best design for laying out a large plot of land lying between William-street on the east, Great George's-street on the west, Exchequer-street on the north, and Jade-street on the south, and intersected by Drury-lane. The competition was limited to ten architects, who all sent in designs on the 10th of May last. These were submitted to Mr. Alfred Waterhouse, A.R.A., of London, who reported on the same to the directors, and advised as to the relative merits of the designs, having regard to the objects and requirements of the company, and with the following results:—

1. (Northern Light)	Messrs. Lockwood & Mawson,	Bradford.
2. (Con Amore)	Messrs. O'Neill & Byrne,	Dublin.
3. (Agora)	Mr. J. N. Deane,	Dublin.
4. (Eblana)	Mr. J. H. Bridgford,	Dublin.

as respectively entitled to the premiums of 160*l.*, 120*l.*, 80*l.*, and 50*l.* offered by the directors.

The architects whose design is placed first will be employed to carry out the work, and the premium awarded to the design will merge in the commission. The selected plan shows a market-hall on the main block, surrounded by a belt of shops, distinct from the market-hall, facing the surrounding streets, and suited to the character of the frontages. The whole of the smaller plot, lying between William-street and Drury-lane, is treated as part of the market-hall, and the roof is carried across Drury-lane.

A broad gangway, 30 ft. in width, runs through from William-street to George-street, about 350 ft. in length; and a cross gangway from Exchequer-street to Jade-street, of similar width, and about 300 ft. in length. The market-hall itself is a parallelogram, 246 ft. long by 112 ft. wide, and will afford accommodation for such retail traders as are usually provided for in covered markets, while the outside frontages to the various streets have been divided into shops, with dwellings or offices over, and of various frontages and depths, according to the relative value of the different frontages. Space has been left between the rear of the houses and the market-hall for the admission of light and air to the backs of the shops and houses.

The roof construction provides for the admission of the chief portion of light into the market-hall from the north, so as to prevent the intrusion of the direct rays of the sun. The whole of the basement story is excavated for cellarage and appropriated as a large bonded store, the central portion (200 ft. by 75 ft.) and inclined roadways thereto being vaulted in brickwork.

It is proposed to construct the buildings throughout in a sound and substantial manner, but with due regard to economy. The rubble work to be of black calp, the basement story and inside walls of Tullaghmore common brickwork, and the back and internal elevations with County Dublin stock bricks.

The principal fronts are to be faced with pressed red brickwork, relieved with moulded bricks and enrichments in terra-cotta. The style of architecture is a simple type of Gothic, and relies for effect more in grouping than on minute elaboration of detail. The windows between the wings and the centre are treated in a simple manner, with double reveals and arches in brickwork finished with a roll moulding. The angles and central gateways are somewhat more ornamental in character, the latter being thus easily recognised as forming the approaches to the market-hall. The estimate of cost submitted by the architects is 69,775*l.*

VERTICAL TUBE VENTILATION.

SIR,—My attention has only just been drawn to a correspondence which appears to have been going on for some weeks in your journal, on the subject of the ventilation of our public buildings.

It has been clearly shown that authorities differ as to whether there is more or less carbonic acid at the top of an inhabited room than near the floor level, but, as the law of the diffusion of gases becomes better known and understood, it is generally considered that this gas, whatever its amount, is evenly distributed in a given volume of air. However this may be, it is not a matter of much consequence if means exist for rapidly changing the air of an apartment so that it has not time to get "vitiated," in the full sense of the word,—that is, to have added to it such a per-centage of carbonic acid gas, &c., as would be injurious to health.

Now, as to the best means for securing circulation, or constant change of air in a room without creating unpleasant draughts, it is noticeable that in discussing the merits of the vertical tube system, some of your correspondents start with the assumption that there is a collection of stagnant and vitiated air at the top of the room, which is disturbed by the incoming, vertically-ascending current of fresh air, and driven down towards the floor; but that appears to me a somewhat unreasonable proposition,—first, because the constant inflow of fresh air will not admit of the collection of the stratum of "vitiated" air; and, secondly, because the fresh or cold air *mixes* with the warmer air already in the room.

Even assuming that the action of the vertical tube system entirely depends upon the difference of temperature,—that is, the higher temperature inside than outside the room, which I do not admit,—such difference in temperature is not necessarily due to the exhalations of the occupants, and the heat engendered by the combustion of gas (as one of your correspondents puts it), but may be caused by the healthy heat of a fire or other suitable warming apparatus.

It has been proved beyond all reasonable doubt that, for influx of fresh air by natural pressure, the vertical tube system, when judiciously applied, is the best known method for all ordinary apartments, for the simple reason that, by means of the tubes, it is possible to introduce considerable quantities of cold air into a heated apartment without causing unpleasant draughts, the air being warmed at the top of the room before it descends to the open fireplace or other outlet.

In smoking or billiard rooms, and in public halls or rooms where a number of people congregate and much gas is burned, it is often advisable, and even necessary, to provide an exhaust-ventilator or suitable extract-shafts from the top of the room, and although this may appear to, and does to a great extent, spoil the theory of the vertical tube system, it is found in practice that the two work very well together.

Some advocates of the vertical tube system have claimed too much for it, forgetting that it is only a means (although a very excellent one) of bringing air into an apartment, and that it is equally important to provide an efficient means for extracting the air.

In large buildings if power can be applied for working the exhaust, in order to get a constant action, so much the better; air will enter through the tubes in all states of the atmosphere.

With regard to the objections made by Mr. Hood to the introduction of large quantities of cold air into public buildings, I believe that any reasonable quantity of cold air may, without discomfort, be introduced by means of the vertical tubes, provided the air-inlets are well distributed and the building properly warmed; and if, as a matter of economy, warmed air should be supplied to the different apartments of a large building, that it may with advantage be delivered through vertical tubes rather than horizontally through perforations in the skirting or through open gratings in the floor. H. C.

DISSENTING CHURCH-BUILDING NEWS.

Halifax. — The Stannary Congregational Church, Halifax, was recently opened. The building is in the Gothic style. Facing into Stannary-street, and close to the school, is the principal entrance. Advantage has been taken of the rapid fall in the ground to form classrooms and vestries on the basement. At the south-east angle of the building is the tower. A slated spire surmounts the tower, rising to a height of about 65 ft. The large gable, facing Richmond-street, has in its centre a large five-light window, the head tracery of which consists of five richly cusped circles. The Alma-street side of the building corresponds with the Stannary-street one. Internally, the chapel is 118 ft. long, 57 ft. wide, and 50 ft. from the floor to the ceiling. It is surrounded by galleries on three sides, the fronts of which are ornamented with rich arcade work, and all the seats, of pitch-pine, are open. The roof to the nave is wagon-headed in form, and is supported by cast-iron columns, with carved capitals, and which carry pointed arches, rising above the gallery level. A boldly moulded arch, supported on each side by cylindrical shafts of new red sandstone, resting on corbels, and bearing carved capitals, opens into a raised recess, nearly level with the galleries. In front of this recess, or chancel, just within the nave, is placed the platform, 24 ft. by 20 ft. The north aisle is set apart for the organ, which we understand is to be built by Messrs. Conacher & Co., of Huddersfield. The choir are to be seated in the centre of the chancel. The large five-light window, 27 ft. high and 13 ft. 9 in. wide, is filled n with stained glass, by Messrs. Powell Bros. The whole of the internal joiners' work is of the best selected pitch-pine, unstained, but varnished. The gallery levels have been arranged to work in with the levels of the adjoining schools, so that the scholars can assemble in their place for service, by passages direct from the school and classrooms. The church is heated with hot-air, upon a principle worked by Messrs. Taylor & Parsons, of Bradford. Accommodation is provided for 1,500 worshippers; 750 on the ground-floor, and 750 in the galleries. The architect is Mr. F. W. Petty, of Halifax, and the work has been admirably executed by the following Halifax contractors:—Masons, Messrs. Hopkinson & Sons; joiner, Mr. James Smith; plasterers, Messrs. Bancroft & Son; plumber, Mr. R. P. Stafford; decorators and painters, Messrs. White & Stringer. The gas-fittings have been supplied by Messrs. Freeman & Collier, of Manchester. The total cost is estimated at 8,000*l.* or 9,000*l.*

Books Received.

Maps of Old London.

MR. EDWARD STANFORD, of Charing-cross, has republished, in cheap and accessible forms, two well-known maps of London in early days. One shows London in the reign of King Charles I., being a *facsimile* of Newcourt's map of London in 1658, engraved by Wm. Faithorne: the "Cities of London and Westminster and the Svburbs thereof, together with ye Burrough of Sovthwark and all ye Throughfares, Highwaies, Streetes, Lanes and Common Allies wth in ye same." The second shows London in 1741—5: "An Exact Survey of the City of London, Westminster, ye Borough of Southwark, and the Country near ten miles round, begun in 1741, and ended in 1745, by *John Rocque*, Land Surveyor, and Engrav'd by *Richard Parr*." Both are exceedingly interesting to residents, antiquaries, and others, concerned in noting the growth of the metropolis. Being drawn to a scale enhances their value topographically, as districts can thereby be definitely traced through the various stages, from fields to the centres of dense populations and spheres of great manufactures.

Miscellanea.

"The Bell" at Edmonton.—The old "Bell," at Edmonton, made famous by Cowper's poem of "Johnny Gilpin," has recently been demolished, and a large modern tavern is being erected on the site. An extensive outbuilding connected with the hostelrie was left standing in the grounds, and has been used as a carpenter's shop since the new house was commenced. Here staircases, doors, window sashes, and other internal fittings were prepared ready for fixing, and on Wednesday evening, last week, the shop contained a large quantity of finished work. Between six and seven o'clock one of the carpenters removed a glue-pot from the fire and placed it upon the ground. Shortly afterwards his attention was attracted by a roaring sound, and on turning round he found a heap of shavings near the fireplace in flames, and it is believed he pulled off a red-hot cinder at the time he removed the glue-pot. The flames extended with extraordinary rapidity, and the building with the contents was entirely destroyed. Unfortunately, too, workmen's tools, worth nearly 100*l.*, were included in the general destruction. No engine attended, and the fire was allowed to burn itself out.

Proposed Church of St. Saviour, Woolcot Park.—The design of Mr. J. Bevan, Bristol, in accordance with the report of Mr. B. Ferrey, the architect, to whom the designs submitted in limited competition were referred, has been accepted.

The Utilisation of Sewage.—A meeting was held on Monday afternoon at Stafford House, presided over by the Duke of Sutherland, for the purpose of discussing the national importance of General Scott's Cement Process in preventing the pollution of rivers, as adopted at Burnley, Lancashire. The Chairman said that a meeting was held at Stafford House in 1872, and Scott's Sewage Company was formed a year afterwards. Ever since then the directors had been trying to show to the world that General Scott's process was a right one. It had been tried at Burnley, and the time had come when it should be shown how the process worked there. When he himself went into the company it was not with the notion of making 5 or 10 per cent., but with the idea that it was a national work. Sir Henry Cole showed specimens of the filthy sludge of Burnley, which, he said, was of about the same description as that of other towns, which, by having lime put into it in proper quantities, became clarified. With a sufficient quantity of lime the water was quite clear. The deposit contained what was necessary for making cement. General Scott's system at Burnley, instead of sending the stuff into the river, purified it, and made cement of the sludge. Towns must learn to pay to be clean; this company could produce a clear effluent; and if a town would pay for it the question was solved. The system he was speaking of was more particularly applicable to London, for if there was one place in the country that had a monopoly for filth it was the Thames. To make London clean in its water would cost only 6d. per head. We may return to the object of the meeting.

The County Government Bill.—The Joint Committee on State Medicine of the British Medical and Social Science Associations have addressed a memorial to the President of the Local Government Board, in which they submit:—1. That until all powers of local government are entrusted to one authority within improved areas of jurisdiction, registration districts offer the most suitable areas of representation in any scheme for improved county government and administration. 2. That the County Board to be constituted under the Bill should be a representative body, having full powers to administer joint institutions to execute joint works for all or some districts within the county, as the case may be, and to exercise control over all local authorities when in default, and when necessary to join with adjacent counties for purposes affecting the interests of both.

Victoria (Philosophical) Institute.—The annual meeting of this Institute was held on Friday, last week, at the house of the Society of Arts, the president, the Earl of Shaftesbury, K.G., in the chair. The honorary secretary, Capt. F. Petrie, read the twelfth annual report, from which it appeared that the number of members steadily continued to increase, the total number being now 756. A considerable number of those who had joined during the year were American and Colonial members, and the extension of the Society's influence abroad, especially in America and the colonies, had been marked; and the members were congratulated upon the fact that such support added greatly to the efficiency with which the Society's objects were carried out. The address was delivered by Principal Rigg, D.D., and contained a review of various systems of philosophy now popular.

Land in Worcestershire and Gloucestershire.—In July Messrs. Glasier & Sons will offer for sale the well-known Middlehill estate, and the whole of the manors of Buckland and Laverton, with the Advowson of the Rectory of Buckland. They contain in all about 2,783 acres. The Mansion-house of Middlehill was for many years the depository of the celebrated library of the late Sir Thomas Phillipps. The mansion is easily susceptible of restoration and improvement, or the materials would save great expense to any purchaser desirous of rebuilding on any of the numerous exquisite sites in the locality, the undulating and picturesque grounds about the house being richly-timbered and of a park-like character, with every facility for the formation of an ornamental lake. The present income is about 4,360*l.* a year.

Saving Life at Sea.—The Council of the Society of Arts offers its Gold Medal for the best means of saving life at sea, when a vessel has to be abandoned suddenly, say with only five minntes' warning, the shore or other vessels being in sight.

St. Michael's Church, Bude, Cornwall.—This church has been considerably enlarged, and has 150 additional sittings. A new chancel and transepts have been built in the Early English style corresponding with the existing building, which was erected about forty years since. The walls are of Trerice stone; the windows and dressings, of Bath stone. The roofs open of red deal lined with boarding between the rafters. The chancel is floored with Minton tiles; the steps are granite. The architect is Mr. Ashworth, of Exeter; Mr. Heard and Mr. Thorne of Bude, are the contractors. The stone carving by Mr. Hems; iron-work by Messrs. Rowe, Exeter. The consecration of the new portion took place on the 23rd ult.

Geniality amongst Antiquaries.—Seventy-two Fellows of the Society of Antiquaries, desiring to show their regard and respect to Mr. Ouvry on his retirement from the office of president, gave a dinner in his honour at the Albion Tavern, Aldersgate-street, on Friday, the 31st of May. The Earl of Carnarvon, now president, was in the chair, and in the course of the evening proposed Mr. Ouvry's health, which was drunk with great cordiality. Mr. Ouvry, in reply, gave an interesting history of his connexion with the Society since 1849. Lord Acton proposed the health of the Chairman; and, thanks greatly to Mr. Edwin Freshfield and Mr. Henry Hill, who acted as honorary secretaries, everything passed off delightfully.

Morecambe Winter Gardens and Aquarium.—The new baths at Morecambe are completed, and will doubtless be well attended. The building adjoining them, which has the appearance of a miniature Crystal Palace, has so far progressed towards completion as to provide an ornament for the promenade by the sea. In it an aquarium is to be formed, and in the upper story there is an orchestra so arranged that musical and dramatic performances on a large scale may be conducted there. It is intended to decorate the place with greenhouse and exotic plants, so that during the cold portion of the year it may form a very attractive winter palace. The building has been designed by Messrs. Waugh & Isitt, of Bradford.

Institution of Civil Engineers.—In the past twelve months there has been a net increase of 133 members, 79 associates, and 66 students, while the honorary members remain the same. These several classes now number 1,072, 1,770, 524, and 16, respectively,—together, 3,382, as against 3,104, at the same period last year, being an increase of the rate of 9 per cent. During the recent session, 95 associates have been transferred to the class of members; 56 members and 208 associates (56 of the latter having before been students) have been elected; and 143 students have been admitted.——The President's *conversazione* passed off satisfactorily. We shall give some considerations on the subject in our next.

Alexandra Dock.—The ceremony of cutting the first sod of the extension of the Alexandra Dock, South Wales, was performed by the managing director of the company in the presence of a number of merchants connected with the trade of the port. The new dock will extend 2,800 ft. in length, and will cover an area of twelve acres. It is expected that notwithstanding the existing depression there will before long be such an influx of shipping into this port that the present accommodation would be too limited.

A Public Hall for Old Hill.—Mr. G. A. S. Best has signified his intention of presenting a public hall to the inhabitants of Old Hill, Staffordshire. The building will cost 5,000*l.*, and will comprise a lecture-room, library, workmen's reading-rooms, refreshment-bar, and depôt for the sale of pure literature. The plans have been passed by the Local Board, and the building will shortly be commenced.

Wood-work. — A correspondent writes,—"You speak of a drawing, why not mention the result of it? In your notice of the Architectural Drawings at the Royal Academy you commend the carved walnut chimney-piece and low bookcases shown in No. 1140, 'Dining-rooms, 52, Princes-gate.' These were very well executed by Messrs. A. J. Arrowsmith & Co., of Bond-street."

Trade Book: Iron.—The new edition of the Trade Book issued by the Thames Bank Iron Company, of Upper Ground-street, contains useful illustrations and lists of prices.

TENDERS

For the reconstruction of Nos. 60 & 61, Above Bar, Southampton (damaged by fire), for Mr. Reuben Newman. Mr. W. H. Mitchell, architect:—

Dyer	£1,430 0 0
Sanders	1,398 0 0
Rowland	1,355 0 0
Crook	1,290 0 0
Stevens & Son (accepted)	1,280 0 0

For additions to Homerton Workhouse. Mr. George, Judge, architect:—

Larke	£7,299 0 0
Thompson	7,140 0 0
Roberts	7,134 0 0
Langmead & Way	6,969 0 0
Shurmur	6,876 0 0
French	6,870 0 0
Cox	6,598 0 0
Wood	5,556 0 0
Boyce	6,314 0 0
Hearle	6,173 0 0
Lewis	6,169 0 0

For new infirmary buildings, covered way, &c., and additions to existing buildings, at the Staines Union, for the Guardians. Mr. George Judge, architect. Quantities supplied by Mr. W. H. Brayshaw:—

Boyce (accepted)	£3,994 0 0

For the erection of an additional wing to warehouse, Stoney-street, Nottingham. Mr. S. Dutton Walker, architect:—

Stevenson	£1,375 0 0
Wooll	1,320 0 0
Underwood	1,280 0 0
Fish	1,275 0 0
Hind	1,260 0 0
Bell & Son	1,252 0 0
Jelley	1,250 0 0
Hodson & Facon	1,240 0 0
Messom	1,237 0 0
Bailey (accepted)	1,199 15 0

For external repairs to the School for Indigent Blind, Southwark. Mr. Richard W. Drew, architect. Quantities by Mr. Thomas M. Deacon:—

Smith & Co.	£2,790 0 0
Holland & Hannen	2,693 0 0
Baker & Son	2,625 0 0

For alterations, &c., at the "Lord Belgrave," Spur-street, Leicester-square. Mr. R. E. Worsley, architect:—

Hockly	£778 0 0
Lamble	770 0 0
Thomas & Butler	759 0 0
Hatchman	725 0 0
Temple & Foster	684 0 0

For the erection and completion of five warehouses, White Hart-street, Paternoster-square. Mr. George Vickery, architect:—

Crabb (accepted)	£9,000 0 0

For proposed vicarage at Forest-gate, Essex. Mr. George McDonell, architect:—

Page (accepted)	£2,480 0 0

For pulling down Nos. 24, 25, & 27, Rood-lane, City, and erecting a block of offices upon the site of 5,000 ft. in area. Mr. Alexander Peebles, architect. Quantities supplied by Messrs. Fowler & Hugman:—

Nightingale (accepted).

For rebuilding premises, No. 4, High-street, Southampton. Mr. J. G. Poole, architect:—

Sanders	£1,298 0 0
Stevens & Son	1,284 0 0
Bailey & Son	1,249 0 0
Hole (accepted)	1,146 0 0

For detached house at Thurlow-hill, Dulwich, for Mr. M. Pope. Messrs. Batterbury & Huxley, architects:—

Young	£1,335 0 0
Nightingale	1,282 0 0
J. & J. Greenwood	1,223 0 0
Lathey, Bros.	1,130 0 0

For additional studio, Haverstock-hill, for Mr. H. R. Robertson. Messrs. Batterbury & Huxley, architects:—

Cox	£382 0 0
Gould & Brand	355 0 0
Eddy	298 0 0
King	245 0 0

For repairs, &c., to the Victoria Theatre, Waterloo-road. Messrs. Batterbury & Huxley, architects:—

J. & J. Greenwood	£561 0 0
Nightingale	535 0 0

For three villa residences, Thurlow Park-road, Dulwich, for Mr. A. Rich. Mr. Walter J. Miller, architect:—

Mitchell	4,500 0 0
Mould	4,352 0 0
Lamble	4,323 0 0
Higgs	4,233 0 0

For finishing four houses in Upland-road, Peckham, for Mrs. Gordon. Mr. Wm. Paice, architect:—

Bodien (accepted*)	£1,260 0 0

* Subject to contract.

East Bury Vicarage.—The surveyors state that no tender has been accepted. Our authority was Mr. Groome.

TO CORRESPONDENTS.

W. J. D.—J. T. R.—H. C.—C. L.—E. R. R.—J. N.—J. O. H. P.—T. M. D.—A. S.—J. D.—B. & H.—B. & S.—W. M.—E. & Co.—J. B.—H. S. S.—W. S.—J. W. S.—E. W. & Co.—W. H. B.—G. P.—W. S.—U. W. (get proper advice on the spot).—Dr. H. S. (shall hear from us).—Bridges (next week).—E. T. B. (thanks).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.